The Effects of Response Interruption Redirection and Differential Reinforcement of Other Behaviors on Rates of Vocal Stereotypy

Thesis

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Abstract

Vocal Stereotypy is a behavior exhibited at high rates by students with Autism Spectrum Disorder. High rates of vocal stereotypy may hinder an individual’s rates of skill acquisition, social development, and become socially stigmatizing to the individual engaging in vocal stereotypy. Previous successful interventions to decrease vocal stereotypy include response interruption and redirection as well as differential reinforcement. This study used response interruption and redirection as well as differential reinforcement of other behaviors to decrease vocal stereotypy as well as increase appropriate vocalizations in three participants with autism. The results showed significant decreases in stereotypy across all participants as well as some increases in appropriate vocalizations.
Acknowledgements

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Major Field:             Education

Specializations:          Special Education
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Chapter 1: Review of the Literature

This chapter reviews the research on vocal stereotypy and interventions that have been used previously to decrease occurrences of vocal stereotypy. In addition, this chapter will review the rationale for intervening on stereotypic behavior.

Vocal Stereotypy

Stereotypic behavior is observed in all individuals, but occurs at a particularly high rate in individuals with developmental disabilities. Stereotypy may be described as a behavior that involves repetition, rigidity, and invariance, as well as a tendency to be inappropriate in nature (Cunningham et al., 2007; Turner, 1999). Stereotypy is a central feature of autism (Kanner, 1943) and is one criterion of the three core diagnostic criteria for autism spectrum disorders (Cunningham & Schreibman, 2007; Lewis & Bodfish, 1998).

Stereotypy occupies a large proportion of the behavioral repertoire of children with autism (Cunningham et al., 2007; Rapp & Vollmer, 2005), thus it is considered an important behavior to target in intervention (Cunningham et al., 2007). An example of vocal stereotypy includes instances of echolalia, which may occur when an individual repeats previously heard conversations or copies scripts from TV shows or movies. Other instances of vocal stereotypy include situations in which an individual vocally exhibits sounds or words that are not
directed towards a specific audience, rather they are maintained by automatic reinforcement. For example, a student may be sitting in circle time activities with his/her classmates, when he/she begins vocalizations such as, “Wuzza-oh! What are we going to do baby birds? Get out of that bathroom!” Stereotypy in all forms has been studied extensively in a broad range of populations, but it has been studied more intensively in the field of developmental disabilities because of the adverse effects high rates of stereotypy can have on learner and social interactions (Lovaas, Koegel, Simmons & Long, 1973; Koegel, Firestone, Krammer, & Dunlap, 1974). The persistence of stereotypy is often thought to interfere with skill acquisition rates and social development, as well as having adverse effects on social consequences (Ahearn, Clark, MacDonald, & Chung, 2007).

In addition to the interference of stereotypy on academic and social skill acquisition, the presence of stereotypy in individuals is socially stigmatizing, often perceived as age-inappropriate in form, focus, context, duration, or intensity. Also, stereotypy may cause undesirable consequences to child development, including in the areas of community involvement, peer and adult interactions, or inclusion in typical education settings (Cunningham et al., 2007). This is evidenced when children with autism engage in higher rates of repetitive, non-functional movement than their peers and lower rates of proximity to their peers (McConnell, 2002). These response classes decrease social learning opportunities for children with autism and thus affect the development of social
Skills over extended periods of time (McConnell, 2002). Given this information, it is evident that stereotypy adversely affects social interaction in many ways including play situations in which individuals with autism are more likely to engage in isolated play, rather than participate in cooperative/positive interactions with their peers (McConnell, 2002). These children typically engage in more challenging behaviors during “free play” opportunities. In addition to social interaction, stereotypy interferes with cognitive learning. Cunningham et al., (2007) report a study by Koegel and Covert (1972) where individuals failed to learn simple discrimination tasks while engaging in stereotypy, but the suppression of their stereotypic behavior through reductive procedures resulted in increased correct responding and the acquisition of discrimination.

Various explanations exist for the maintenance of stereotypy, including but not limited to automatic reinforcement, avoidance of other stimuli, or access to other types of stimulation (Kennedy, Meyer, Knowles, Shukla, 2000). A substantial body of research provides evidence for a sensory function of stereotypy, whereby behavior is maintained by automatic reinforcement (Ahrens, Lerman, Kodak & Keegan, 2011; Cunningham et al., 2007; Piazza, Adelinis, Hanley, Goh, & Delia, 2000; Rapp, 2006). Ahearn et al. (2007) report supporting research (Iwata, 1999) indicating that vocal stereotypy is maintained by automatically reinforced sensory consequences. For example, a functional analysis conducted by Falcomata et al. (2004) determined that vocal stereotypy was maintained by automatic reinforcement through the evaluation of alone,
attention, demand, toy play, and tangible conditions with high rates of stereotypy displayed across all conditions, and continued high rates of vocal stereotypy displayed in extended alone conditions. Similar procedures conducted by Ahearn and colleagues (2007) consisted of a functional analysis evaluating various antecedent conditions such as alone, toy play, attention, and demand demonstrated that vocal stereotypy occurred in all conditions, with the highest rate for all participants during the alone condition. These results suggest that vocal stereotypy is maintained in many individuals by an automatic reinforcement or sensory stimulation function. Other research has determined that the function of stereotypy was difficult to determine, as it occurred across all conditions and may then be determined to be multiply controlled (Kennedy et al., 2000). Although not all research describes vocal stereotypy under the sole function of automatic reinforcement, it is important to note that vocal stereotypy typically is maintained at least in part by this function (Kennedy et al., 2000). For example, an analogue functional assessment conducted by Kennedy and colleagues found that stereotypy existed across all assessment conditions, but remained the lowest in recreation conditions. This research implies that the stereotypy may have been maintained by various conditions, but remained consistent with other research suggesting that stereotypy continues to serve an automatic reinforcement function. Given this extensive, yet inconclusive research, it is important to design behavior interventions targeting vocal stereotypy according to the function of the stereotypy rather than the
topographical form of the behavior or the assumption that the behavior is under the function of automatic reinforcement as the maintaining contingency (Cunningham et al., 2007).

**Response Interruption and Redirection (RIRD)**

Response interruption and redirection (RIRD) is generally described as an evidence-based practice used to decrease interfering behaviors, namely to interrupt a behavior and redirect the individual back to a more appropriate behavior alternative (National Professional Development Center for Autism Spectrum Disorders, 2010). RIRD was derived from the concept of response blocking as it attempts to block stereotypy by producing appropriate behavior that was momentarily incompatible with vocal stereotypy (Ahearn et al., 2007). Upon an instance of vocal stereotypy, response interruption may occur when the instructor interrupts the student with a series of known questions requiring a vocal response such as “What’s your name?” “What color is this?” or “What school do you go to?” Once the student’s behavior has been successfully interrupted, the instructor redirects the student to a more appropriate behavior (e.g. “You can talk about the game we are playing”). RIRD is most successful due to the idea that interrupting vocal responses and redirecting the individual back to appropriate responses may decrease the probability of problem behavior (Ahearn et al., 2007).

Response interruption or response blocking has been effective in reducing rates of behaviors maintained by automatic reinforcement (Fisher,
Grace & Murhpy, 2006), which has implications for response interruption or response blocking to be a reasonable procedure to reduce rates of vocal stereotypy (Ahearn, Clark, Gardenier, Chung & Dube, 2003). Response blocking of stereotypic behavior typically consists of blocking an action. For example, keeping an individual’s hand from tapping the object from which they are trying to make hand contact can effectively block hand tapping. Blocking vocalizations, however, involves a more complex operation. Current research has suggested that vocal stereotypy may be “blocked” by using a response interruption and redirection procedure (Aheran et al. 2003). For example, upon an instance of vocal stereotypy, a practitioner may “interrupt” the speaker by placing demands or asking questions of the speaker that require vocal responses that are incompatible with the vocal stereotypy. For example, when an individual engages in vocal stereotypy, a practitioner may interrupt the stereotypy by asking questions about the current activity such as, “What game are we playing?” which requires the individual to cease engaging in stereotypy (blocking) and replace that engagement with socially-maintained vocalizations in the form of answering a question. Other research suggests that response interruption may be an alternative way of providing access to the sensory stimulation that controls the behavior (Goh, et al. 1995). Response interruption may provide stimulation similar to the stimulation received during vocal stereotypy, but in a more socially acceptable manner as well as teach the individual to access such stimulation through more socially accepted means of redirection.
Additionally, RIRD may be a useful vocal stereotypy treatment to interrupt chained responses. Previous research has suggested that interrupting a response chain may alter the future probability of the chain occurring (Lattal, & Doepke, 2001), which suggests that interrupting a vocal stereotypy “script” may stop the script either momentarily or for a long-term outcome by not allowing the individual access to the terminal reinforcement of completing the “script.” Ahearn et al. (2007) demonstrated the immediate efficacy of response interruption and redirection when their results decreased immediately to lower levels and appropriate vocalizations occurred more frequently upon the introduction of RIRD alone (Ahearn et al., 2007). In this study, the authors trained teachers to implement RIRD for students with autism spectrum disorder by interrupting students who engaged in vocal stereotypy immediately upon the occurrence of the stereotypy by stating the student’s name and asking a series of questions requiring vocal responses. The goal of the study was to block stereotypy responses and redirect students to appropriate responses. In addition to RIRD successfully decreasing vocal stereotypy, results have shown that upon the introduction of RIRD, appropriate vocalizations tend to increase and are thus a positive side effect of RIRD (Ahearn et al., 2007). Cassella, Sidenor, Sidenor, & Progar (2011) replicated these results using a reversal design for two participants with autism spectrum disorder in which the participants’ instances of stereotypy were immediately interrupted by demands placed upon the participant. Results from this study show decreases in vocal stereotypy during
treatment phases with subsequent increases in vocal stereotypy during baseline and return-to-baseline phases.

**Differential Reinforcement of Other Behaviors (DRO)**

Differential reinforcement of other behaviors (also known as a DRO) is a reinforcement procedure used to reinforce an individual for engaging in any behavior other than the behavior targeted for reduction (Cooper, Heron, & Heward, 2007). In a DRO procedure, an individual is reinforced for engaging in any behavior that is not the target/problem behavior. For example, an individual may exhibit a problem behavior of swearing, in which case a DRO procedure would reinforce the individual for engaging in all other behaviors other than swearing, including using nice words or not talking. It has been well researched and demonstrated that the contingent or non-contingent delivery of reinforcers can decrease the frequency of undesirable behavior apparently maintained by automatic reinforcement (Ahearn et al., 2003).

External reinforcers have previously been used to successfully compete with behaviors maintained by automatic reinforcement (Fisher & Mazur, 1997). Further evidence shows external, tangible reinforcers effective in reducing undesirable vocalizations (Adelinis, Hanley, Goh & Delia, 2000; Cowdery, Iwata, & Pace, 1990). Research conducted by Ahearn et al. (2003) used preference assessments and competing items assessments to evaluate the effects of access to these items on rates of vocal stereotypy. The researchers found that competing items, regardless of matched stimulation, reduced rates of vocals...
stereotypy in a child with autism spectrum disorder. This research lends support
to the position that highly preferred reinforcers can help clinicians reduce rates
of behavior maintained by automatic reinforcement. Further support of this is
seen in a study by Ahearn et al. (2003) in which 3 children with autism who
engaged in vocal stereotypy accessed preferred stimuli on variable time
schedules and had schedules in which access to preferred stimuli was denied.
Results indicated that each participant’s vocal stereotypy was sensitive to
external reinforcement contingencies. That is, behavior resisted change without
reinforcement contingencies but declined when the experimenters introduced
reinforcement contingencies. As previously stated, vocal stereotypy can serve a
number of functions including, but not necessarily limited to, automatic
reinforcement. However, despite the array of maintaining variables, it has been
shown that reinforcers are able to compete in ways such that individuals vary
their responding according to the value of available reinforcers (Fisher et al.,
1997). To compete effectively with other variables maintaining stereotypy,
external, tangible reinforcers have been used. Studies using tangible reinforcers
to reduce automatically reinforced problem behavior include Ahearn et al.
(2003) in which access to preferred items showed a decrease in rates of vocal
stereotypy, as well as research involving non-contingent reinforcement and
response cost conducted by Falcomata et al. (2004), and other researchers
(Fisher et al., 1997; Lindberg, Iwata, Kahng, & DeLeon, 1999). Thus, tangible
reinforcers can be arranged to reduce rates of automatically reinforced behavior including vocalizations.

Alternative forms of stimulation that provide the individual with a higher quality of reinforcement may cause an individual to switch from aberrant behavior to the higher quality reinforcer (Fisher et al., 1997). This information is most applicable in this study as individuals receive tangible reinforcement items as a DRO reinforcement. In addition, this is a time for them to engage in vocalizations as they choose, which also may include vocal stereotypy. For maintenance and generalization purposes, the schedule of a DRO may be thinned by systematically increasing the schedule length based on latency to responding or inter-response times (IRT) during previous sessions (Lalli, Casey, & Kates, 1997). By gradually increasing the delay, an individual may shift his/her preference from the smaller immediate reinforcer to the larger, time-delayed reinforcer (Dixon, Rehfeldt, & Randich, 2003). Furthermore, the use of a DRO may facilitate the acquisition of self-control (refraining from engaging in vocal stereotypy for a period of time as it relates to this study) by teaching the individual to select the larger delayed reinforcer over a smaller immediate one (Dixon et al., 2003). In sum, external reinforcers may compete with automatic reinforcers (such as vocal stereotypy) and decrease response rates (Ahearn et al., 2007; Fisher et al., 1997). Given this information, participants may allocate their responding
(engagement in appropriate or inappropriate vocalizations) in accordance with how much they value each reinforcer (Fisher et al., 1997).

The previous successes of external reinforcers in the competition with and reduction of stereotypy suggest that a differential reinforcement of other behaviors (DRO) procedure should be successful in decreasing rates of vocal stereotypy. Furthermore, it has been demonstrated that DRO's are effective in reducing disruptive behavior (e.g. vocal stereotypy), but are not entirely effective when used alone (Conyers, Miltenberger, Maki, et al., 2004). For example, one study by Conyers et al. (2004) compared the use of baseline, DRO and response cost procedures. The researchers found that although a DRO was able to reduce rates of vocal stereotypy, to levels lower than baseline levels, the DRO procedure did not yield clinically significant results, suggesting that it be combined with other reductive procedures when used to treat vocal stereotypy. The use of tangible reinforcers through a DRO procedure should, then, be effective in reducing rates of vocal stereotypy as long is it is paired with other interventions, such as response interruption and redirection.

**RIRD + DRO**

Reinforcers have effectively reduced rates of automatic reinforcement in numerous studies (Ahearn et al., 2003; Athens et al, 2008; Conyers et al, 2004; Falcomata et al, 2004; Fisher et al, 1997). DRO procedures also evidence some positive effects in reducing vocal stereotypy, largely when paired with other...
procedures (Ahearn et al., 2007). According to White & Cameron (2000) adding extrinsic reinforcers into a context in which intrinsically reinforced behavior occurs may increase persistence (that is, they may increase the likelihood of the intrinsically reinforced behavior such as social interaction or appropriate vocalizations to occur) (Ahearn et al., 2003). White & Cameron (2000) also proposed that this theory could be tested by exposing behavior to extinction (e.g. response interruption). This theory is supported by Fellner, Laroche, & Sulzer-Alzaroff, (1984), who found that low levels of vocal stereotypy resulted when they combined the use of response interruption and redirection with a differential reinforcement procedure (Ahern et al., 2007). In this intervention, the researchers interrupted instances of vocal stereotypy through the use of response interruption and redirection as well as reinforcing individuals for the absence of engagement in vocal stereotypy using a DRO procedure.

Communication training, however, (or redirecting verbal behavior in this study) without the use of extinction will frequently fail to result in sufficient reductions in problem behavior (Tiger, Hanley, & Bruzek, 2008). Additionally, response interruption is a promising intervention, but does not sufficiently address the instruction and acquisition of appropriate replacement behaviors (Ahearn et al., 2007).

**Using Training Procedures to Promote Appropriate Vocalizations**

Social interaction and development should be a routine component (when needed) of any educational treatment program (McConnell, 2002).
Ahearn et al., (2007) suggest that future research aim to test the effects of arranging specific instruction for appropriate vocal behavior in combination with response interruption. Given this information, it is likely that specific verbal training during response interruption redirection would enhance the effectiveness of the intervention (Ahearn et al., 2007).

**Discrimination Training**

Discrimination training is a procedure in which a response is reinforced in the presence of one stimulus while not reinforced in the presence of other stimuli (Cooper et al, 2007). Teaching examples, non-examples, and multiple exemplars are key components in teaching individuals to generalize concepts learned (Cooper et al., 2007). In addition, these skills are effective when used during instructional interventions in social skills training procedures (McConnell, 2002). Moreover, effective child-specific interventions for children include explicit skills training with prompting and reinforcement (McConnell, 2002).

These procedures outline ways to implement effectively discrimination training through social skills instruction for individuals with vocal stereotypy in order to teach examples and non-examples of vocal stereotypy as well as examples and non-examples of appropriate vocalizations. Discrimination training is largely effective because by teaching “don’t do it” examples, intermixed with positive examples, learners practice discriminating stimulus situations in which the target behavior should and should not be emitted, which
subsequently sharpens the stimulus control necessary to master the concept or skill (Cooper et al., 2007; Engleman & Carnine, 1982). A study by Horner, Eberhard, and Sheehan (1986) demonstrates this strategy by teaching four students with mental retardation to bus tables using examples of when to bus tables and when it would be inappropriate to bus tables. Results showed that the individuals in the study acquired the skill and were able to generalize the skill to novel settings. Carr (2003) discussed the effectiveness of the exclusion paradigm in the acquisition of new vocabulary by teaching examples and non-examples of word to picture relations. This research has implications in teaching many skills, including social skills by using examples as well as non-examples/exclusions to a rule to teach appropriate social skills. By teaching individuals to discriminate between appropriate and inappropriate instances of a behavior is an effective means in teaching skill acquisition and generalization across many skills and concepts (Cooper et al., 2007).

**Purpose of the Study**

As stated previously, the effects of response blocking on automatically reinforced behaviors have been shown effective in many studies; however, verbal behavior that is automatically reinforced is more difficult to block. Some research has indicated that interrupting verbal responses might be effective in “blocking” this behavior. Currently, the research on the reduction of vocal stereotypy is limited. Therefore, this study sought to examine the effects of 1.) response interruption and redirection (RIRD) combined with 2.) differential
reinforcement of other behaviors (DRO) and 3.) discrimination training on rates of vocal stereotypy and possible increased rates of contextually appropriate vocalizations. The specific questions this study sought to address are:

1. What effects will combining discrimination training, response interruption and redirection, and differential reinforcement of other behaviors have on the reduction of rates of vocal stereotypy in individuals with Autism Spectrum Disorder?

2. What effects will combining discrimination training, response interruption and redirection, and differential reinforcement of other behaviors have on rates of contextually appropriate vocalizations in individuals with Autism Spectrum Disorder?

3. What effects will combining discrimination training, response interruption and redirection, and differential reinforcement of other behaviors have on the generalization of reduced vocal stereotypy and/or increased rates of contextually appropriate vocalizations across settings, time and/or teachers?

4. How will teachers perceive the effects of the treatment on pupil behavior (as measured by a social validity questionnaire)?

To date there is research on the use of RIRD on vocal stereotypy, the use of discrimination training on vocal stereotypy, as well as the use of a DRO procedure on stereotypy, but no published study has demonstrated the effects of the combination of any of these interventions on vocal stereotypy and/or
contextually appropriate vocalizations. Therefore, this study attempted to combine these research methods, some of which had been previously shown effective in reducing rates of stereotypic behavior when used alone. Thus the purpose of the current study was to address the use of (1) training procedures to promote discrimination between appropriate and inappropriate vocalizations, (2) response blocking through the use of response interruption and redirection and (3) DRO procedure in order to decrease vocal stereotypy by reinforcing appropriate vocalizations on the rates of appropriate and inappropriate vocalizations.
Chapter 2: Method

This chapter presents a description how the study was conducted. The specific sub-sections of this chapter include the participants, the settings and materials, dependent variables and data collection, inter-observer agreements, procedural integrity, experimental and general procedures, experimental design, and social validity.

Participants and setting

The participants in this study included three students ages 6-12 that attended a day clinic for individuals with Autism Spectrum Disorder. At this center, students received one-on-one instruction for a majority of the day, and group instruction for two half-hour sessions where a group of 5-10 students received social skills and group-attending skill instruction with 1 lead teacher and several staff support members. All participants in this study engaged in high to moderate rates of vocal stereotypy. The participants were selected for this study according to the following criteria: (a) had a diagnosis of autism, (b) had been recommended by classroom teachers or program managers for participation in this study based on their rates of vocal stereotypy and its interference with social and/or instructional situations (for specific questions asked, see appendix F), (c) engaged in contextually-inappropriate vocalizations that were determined to be automatically reinforced (functional behavior
assessments) and (d) parental permission to participate in the study. See Appendices G, H, and I.

Marvin was a 10-year-old Latin-American male who had been diagnosed with autism, attention deficit hyperactivity disorder (ADHD), and moderate mental retardation. On the Vineland Adaptive Behavior Scales (VABS-II), Marvin scored 57 in the area of communication, 52 in the area of daily living, and 50 in the area of socialization; all of which are in the moderate deficit range. Marvin’s language skills consisted of a strong echoic repertoire, requesting highly preferred items, and answering trained questions (e.g. “What’s your name,” “What’s your mom’s name,” Who comes at Christmas”). His mode of communication was vocal and he usually communicated in 2-5 word phrases. Marvin’s vocalizations included screaming, incomprehensible speech, and repeating commercials.

Mark was a 12-year-old Caucasian male who had been diagnosed with moderate mental retardation. On the VABS-II, Mark scored 59 in communication, 55 in daily living skills, and 57 in socialization; all scores were in the moderate-deficit range. Mark’s mode of communication was vocal and typically consisted of 4-7 word phrases. Mark was able to request items, actions, and adjectives spontaneously and was able to answer basic “wh” questions. Mark’s stereotypy consisted of repeating conversations he had heard in the past, copying memorized movies, and yelling incomprehensible vocalizations.
Henry was a 6-year-old African American male who had been diagnosed with autism. On the VABS-II, Henry scored, 63 in the area of communication, 73 in the area of daily living, and 70 in the area of communication; all of which fell in the mild to moderate deficits area. Henry had a strong echoic repertoire, which often resulted in him repeating all instructions given by teachers. Henry was able to request highly preferred items with adjectives and answer trained questions (e.g. “How are you,” “What’s your name,”) and questions regarding colors of items. Henry’s mode of communication was vocal and he typically spoke with 3-5 word phrases. Henry’s stereotypy consisted of copying Scooby Doo and Spongebob. He had incoherent speech, and repeated the statements of others throughout the school day.

Sara was a 9-year-old Latin American female who had been diagnosed with autism. Sara had a strong echoic, mand, and tact repertoire, with an emerging intraverbal repertoire. Sara’s mode of communication was vocal and she typically spoke in 5-7 word phrases. Sara’s stereotypy consisted of singing songs and repeating TV shows such as Wonderpets and Blue’s Clues.
<table>
<thead>
<tr>
<th></th>
<th>Marvin</th>
<th>Mark</th>
<th>Henry</th>
<th>Sara</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at start of study</td>
<td>10.25</td>
<td>12.7</td>
<td>6.8</td>
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<tr>
<td>Communication Domain</td>
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<td>59 (moderate deficit)</td>
<td>63 (moderate deficit)</td>
<td>62 (moderate deficit)</td>
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<td>Daily Living Skills Domain</td>
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<td>55 (moderate-severe deficit)</td>
<td>73 (mild deficit)</td>
<td>61 (moderate deficit)</td>
</tr>
<tr>
<td>Socialization Domain</td>
<td>50 (severe deficit)</td>
<td>57 (moderate deficit)</td>
<td>70 (mild-moderate deficit)</td>
<td>51 (severe deficit)</td>
</tr>
</tbody>
</table>

Table 2.1: Participants' ages and test scores

*Note: All test scores taken from the Vineland Adaptive Behavior Scores II (VABS-II) assessment (Sparrow, Balla, & Cicchetti, 1985) pulled from student records. The VABS-II-II is based on an average score of 100 with a standard deviation of 15.*

All functional assessments and treatment sessions were conducted in an isolated room in order to minimize distractions. The room size was 3M by 4M for Marvin and Harry, and was typically used for small group instruction. Henry and Sara were taught in an 8M by 10M room that was typically used as a cafeteria. The researcher conducted the sessions while the participants' behavioral therapist sat either in the back of the room or outside of the doorway in case needed for support with students who engaged in challenging behavior. The room was equipped with specified reinforcers, materials needed for social interaction (such as games, puzzles, etc), table, chairs, and a wide angle video camera. Generalization probes and follow-up portions of the study were
conducted in the participant’s regularly classroom and within their typical daily routine.

**Materials**

**Functional behavior assessment data collection sheet.** The experimenter collected data on the occurrences of vocal stereotypy using tallies and direct observations of the participants. These data were collected on a chart that outlined the various reasons for vocal stereotypy including antecedents such as attention, alone or no attention, denied access to an item, a demand presented, or other reasons which were specified. Data for this sheet also included perceived functions of the stereotypy such as to gain attention or access to an item, to escape a demand, or automatic reinforcement. Finally, data were tallied on this sheet to indicate the type of stereotypy displayed, including non-contextual vocalizations, singing, copying tv shows or movies, and copying others. This assessment was based on direct observation assessment methods and data collection strategies outlined by O’Neill, Horner, Albin, Sprague, Storey, and Newton (1997). See Appendix A.

**Functional behavior assessment questionnaire.** The experimenter used a questionnaire which was given to teachers to identify possible maintaining variables of the student’s vocal stereotypy, to obtain a description of the student’s vocal stereotypy, and to narrow the focus of events that may precede events of stereotypy (O’Neilet al., 1997). The questionnaire included
questions regarding rates and intensity of vocal stereotypy, descriptions of the behavior, and the settings in which the behavior occurred. See Appendix B.

**Instructional script.** A discrimination training script was used at the beginning of each intervention session of the study to help the learner identify various forms of appropriate and inappropriate language. The script was implemented using a direct instruction method with active student responding throughout the lessons. The script included 5 lessons lasting an average of 5-10 minutes each. The lessons were based on various types of stereotypy the participants typically engaged in, including: copying TV shows or movies, copying others, non-contextual/non-word vocalizations, singing out of context, and a review of the skills taught. Each lesson included discrimination yes/no questions at the end of the lesson where students were required to meet a criterion of 75% mastery to advance to the next lesson. See Appendix C.

**Data collection sheets for the instructional script.** The experimenter used a data collection sheet to record the number of correct responses during the discrimination training sessions and record whether or not the student met the mastery criterion to advance onto the next lesson. The data collection sheet consisted of columns and rows for recording such information for each participant as well as a percentage of correct responses. See Appendix D.

**Multiple stimulus without replacement preference assessment.** A Multiple Stimulus without Replacement Preference Assessment (Mason, McGhee, Farmer-Dougan, & Risley, 1997) was used to determine specific reinforcers for
the DRO/token economy procedure used in the intervention phase of the study. The student was given opportunities to choose his/her most preferred items repeatedly, which were recorded on this data collection sheet using +/- scoring and creating an array of multiple preferred items creating a hierarchy of preferred stimuli. The top two items chosen from the preference assessment were selected and offered to the student throughout the treatment sessions as reinforcement for appropriate vocalizations. See Appendix E.

**Video recording tools.** The video recording equipment used in this study was a Cannon MD-255 camera. All sessions of the intervention (functional assessments, baseline, intervention sessions, generalization probes in the natural learning environment, and maintenance probes in the natural learning environment) were video recorded to ensure accurate data collection across observers.

**Functional Assessment Screening Tool (FAST).** The FAST (Goh, Iwata, & DeLeon, 1996) was used as an additional assessment tool to determine the primary function of the participant’s vocal stereotypy. The FAST is a commercially available screening tool developed at Florida Center for Self Injury. It is used to identify environmental and physical variables that may influence problem behaviors. It is an informant rating scale consisting of 18 questions regarding the antecedents and consequences of the participants’ problem behavior (Moore, Edwards, Wilczynski, & Olmi, 2001). The FAST was used as part of a comprehensive functional assessment for problem behavior (specified
in this study as vocal stereotypy). The assessment yielded functional predictions of the behavior including attention/access to preferred items, escape, sensory stimulation, and pain attenuation. See Appendix F.

**Data collection sheets for appropriate and inappropriate vocalizations.** The experimenter used a data collection sheet in every session (including baseline, intervention, generalization probes, and maintenance probes) to record rates of vocal stereotypy, rates of contextually appropriate vocalizations as well as rates of response interruption and redirection. These data sheets included separate tables with +/- data for rates of inappropriate and appropriate vocalizations and tallies used to track instances of response interruption and redirection. See Appendix G.

**Token economy system.** The experimenter used a token economy system to reinforce individuals for the DRO procedure. The token economy system consisted of a timer and a sheet of paper with 3 Velcro picture tokens that were earned by the student for each time interval in which they did not engage in vocal stereotypy. Upon receiving three tokens and placing them on their token board, the individual was instructed to exchange their three picture tokens for a back up reinforcer. See Appendix H.

**Social validity questionnaire.** A social validity questionnaire was developed for teachers and program supervisors regarding their perceptions of the effectiveness, practicality, and overall acceptance of the intervention in the school-based setting. See Appendix I.
**Staff implementation of RIRD data collection sheet.** Staff were asked to collect data on the rates of response interruptions and rates of appropriate vocalizations following staff training on how to implement the intervention. Staff data were collected and converted into responses per minute. See Appendix N.

**Dependent and Independent Variables**

**Independent variables.** The independent variables in this study were 1) response interruption and redirection, 2) differential reinforcement of other behaviors (DRO) on a fixed time schedule and 3.) discrimination training in which individuals were instructed to label vocalizations which were appropriate/ inappropriate. Response interruption and redirection was used upon instances of vocal stereotypy. In this procedure, the participant was asked a series of previously learned/known questions followed by a brief redirection to appropriate vocalizations or to continue with the previous task demand.

Discrimination training procedures were used to teach participants to identify forms of vocal stereotypy and “friendly words” or appropriate vocalizations. The discrimination training followed 5 lessons in which there was a different form of stereotypy identified for each lesson (copying TV shows or movies, copying others, singing, and non-contextual language). The participants were required to master one lesson with 80% accuracy prior to progressing to the next lesson.

The intervention utilized differential reinforcement of other behaviors (DRO), which is defined as the reinforcement of the absence of the problem
behavior (Cooper, Heron, & Heward, 2007). More specifically, the DRO was used to reinforce the student for engaging in all behaviors other than vocal stereotypy using a token system. Upon receiving 3 tokens, the participant exchanged his or her tokens for a predetermined back-up reinforcer for 30 seconds. The criterion used to set the initial DRO was based on that recommended by Cooper et al.. In this formula, the sum of the total interval time between stereotypy throughout baseline was divided by the total number of intervals. This number yielded the average time between vocalizations. As recommended by Copper et al., (2003), and colleagues, the DRO criterion was set slightly higher than the average amount of time between vocalizations (typically 20% higher than the average time between vocalizations). In sessions where a participant completed a DRO session (earned all 3 tokens) without the implementation of response interruption and redirection, the DRO criterion was raised systematically by increasing the DRO by the length of one time interval of the previous DRO. For example, if an individual was using a 30-second DRO (with 3 tokens at 10 second intervals each) and successfully completed this criterion without the implementation of response interruption and redirection, the following session would be conducted with a 40 second DRO (with 3 tokens at 13 seconds each).

**Dependent variables.** The dependent variables in this study were 1) the rates of vocal stereotypy, or inappropriate vocalizations, exhibited during a 10-minute activity, 2) the rates of appropriate vocalizations as described above during the same 10-minute activity, 3) the latency between the onset of the DRO
and the offset of the DRO in which the individual was able to access reinforcement for appropriate vocalizations, and 4) the average inter-response time between inappropriate and appropriate vocalizations. Vocal stereotypy or “inappropriate vocalizations” were defined as instances of audible language out of the context of the situation. Instances of vocal stereotypy did not include functional speech, gestures, laughter, requests for items, requests for information or repeating teacher directions (e.g. for clarification or self management, self instruction, etc.). In addition to the definition of vocal stereotypy, contextually appropriate vocalizations were defined as audible vocalizations that could be heard from a minimum of 1.5 feet away from the speaker that were in the context of the situation or activity, were functional speech as defined by Skinner’s verbal operants (e.g. requesting items, activities, or information, commenting on elements of the current environment, etc.), and were not speech directed or encouraged by the researcher or a teacher.

Data Collection

The researchers recorded the occurrence or non-occurrence of vocal stereotypy as well as the occurrence and non-occurrence of appropriate vocalizations using a partial interval method with 20-second time intervals for 7-10 minute sessions. The data were measured using a partial interval time sampling method with a 20-second interval recording system. Vocalizations were only recorded inside the time frame of the DRO (from the onset of the DRO
until the individual received his/her 3rd token and reinforcement). In addition, vocalizations during RIRD were recorded.

The partial interval recording method was used because it provided a more accurate measure of behavioral occurrences than a direct measure of rate due to the varying lengths of an episode of stereotypy (e.g. an instance of stereotypy may last shorter than 2 seconds or longer than 1 minute). In addition, duration was not selected due to the high chance for error involved with the possibility of quick onsets and offsets of instances of stereotypy. The observers could easily apply the partial interval method due to the fact that the sessions were recorded and observers could refer back to video recordings as needed.

The researchers also recorded instances of response interruption and redirection during the intervention phase as well as the onset and offset times of the differential reinforcement of other behaviors intervention in order to determine the latency between an individual beginning a DRO session and receiving reinforcement.

Procedural integrity was calculated for 33% of sessions based on video recordings of the sessions. The procedural integrity of the study was assessed according to whether or not the researcher 1) implemented the scripted lessons with correct first response data collection, 2) implemented a preference assessment, 3) implemented response interruption and redirection upon instances of vocal stereotypy, and 4) was accurate in the implementation of vocal stereotypy (whether the researcher required 3 correct, consecutive vocal
responses to return to the DRO session, and whether the researcher gave a redirection to appropriate behavior following instances of response interruption and redirection). The scores of each session recorded for treatment integrity were converted into a percentage (times of correct implementation/total opportunities). This information was recorded as an average to determine the overall score of treatment integrity for the study. See appendix J for an example of the procedural integrity checklist.

Inter-observer agreement was conducted using video-recorded sessions for at least 33% of all sessions. In sessions where a second observer was involved, the second observer watched video recordings of the sessions and took the same data the researcher had taken. During the functional behavior assessment and direct observation sessions, inter-observer agreement was calculated using the total agreement method where the observers ranked the perceived function and type of stereotypy exhibited by the participant for each instance of stereotypy during the observation period. The perceived functions data were based on antecedents and consequences surrounding each instance of vocal stereotypy. During baseline and treatment phases, the primary instructor and the second observer calculated the data using the mean count per interval formula to determine the percentage of inter-observer agreement. The formula for this method is \[ \frac{\text{Interval 1 IOA} + \text{Interval 2 IOA} + \text{Interval N IOA}}{\text{number of intervals}} \times 100 \] where each interval of IOA is conducted by: Smaller count of behavior occurrences / Larger count of behavior occurrences X 100 and N= each
successive interval. See Appendices K, L, and M for examples of the data collection sheets used for inter-observer agreement.

**Experimental design.** The research design was a multiple probe across subjects. This design is particularly appropriate for this study because a ritualistic baseline data collection method would be unnecessary for participants who are highly unlikely to improve in performance without the subject having access to components of the intervention (Cooper et al., 2007). Cooper et al. describe this design as a variation of the multiple baseline design in which intermittent measures, or probes, are taken during baseline rather than consecutive measures. In this design, every individual received baseline sessions for varying amounts of time. Once an individual’s baseline rates were stable, the intervention was implemented for one individual at a time. Baseline data for participants who were not receiving the intervention were recorded initially to determine a steady rate of the target behaviors and were subsequently taken just before and just after any other participant received the intervention. This design allowed for an individual to receive the intervention once baseline was stable while other baselines were allowed time to stabilize. In addition, the multiple probes allowed sufficient baseline data to be collected without significantly interfering with the participants’ daily routine or surroundings. This design may have demonstrated more experimental control for this particular study than other possible designs because of the irreversibility
of learning from the intervention’s instructional sessions used to teach an individual to identify inappropriate/appropriate vocalizations.

**Procedures**

**Baseline.** The experimenter collected functional behavior assessment data during baseline sessions to determine the possible function of the participants’ vocal stereotypy. The experimenter directly observed the student for at least 5 sessions to determine possible functions of the student’s vocal stereotypy. The experimenter recorded instances of vocal stereotypy and the environmental antecedents as well as the consequences following an event of vocal stereotypy. Vocal stereotypy with a perceived function of access to attention was scored in instances in which the individual engaged in vocal stereotypy when they were receiving no attention, and vocal stereotypy ceased upon the researcher providing attention. Vocal stereotypy was scored as likely maintained by escape in situations in which the individual was requested to complete a task or researcher request, followed by the participant engaging in vocal stereotypy. Instances were scored as likely maintained by access to tangibles when the participant engaged in vocal stereotypy following instances in which the researcher denied the participant access to a particular item. Occurrences maintained by automatic reinforcement were scored when the participant engaged in vocal stereotypy while receiving researcher attention as well as access to items or toys.
The experimenter used a multiple probe technique to collect baseline data at least once per week for no less than 5 baseline probes. During baseline, the experimenter took each student individually to a therapy room and sat the student at a table with the instructor. The researchers observed and video recorded the students for the purpose of assessing inter-observer agreement. The researchers observed the students for 10-minute sessions while the students engaged in teacher-directed tasks (e.g. completing an instructional or downtime task, playing a game, etc.). The researchers assessed the student’s vocal stereotypy with a partial interval measurement procedure with which they recorded data every 20 seconds, indicating whether or not the student engaged in stereotypic vocalizations. In addition to these observations, teachers completed a functional behavior assessment questionnaire and the Functional Assessment Screening Tool (FAST). The experimenter requested the staff who worked with the participants on a daily basis to complete the functional behavior assessment questionnaire and the FAST.

The experimenter collected data in these sessions using the same method to determine the student’s rate of engaging in appropriate vocalizations. The experimenter measured appropriate vocalizations using 20-second intervals where the observer indicated whether or not the participant engaged in appropriate vocalizations (i.e. the absence of stereotypy).
In addition to the clinic settings, the experimenter also collected baseline data on the student’s stereotypy within the student’s daily educational environment and routine for 8-10 minutes per observation.

**Intervention.** The intervention phase consisted of three components each session. These three components included discrimination training on vocal stereotypy, a preference assessment, and a teacher led activity. In the intervention phase, students received the intervention for 4-5 sessions per week in 20-minute instructional sessions, which were video recorded. At the beginning of each session, the experimenter took each participant individually to a therapy room and sat the participant at a table with the instructor.

**Training.** Prior to starting each session, the experimenter taught the student a lesson on vocal stereotypy. The lesson series consisted of five lessons (one per session) on discrimination training on vocal stereotypy. The experimenter faded the lessons by decreasing the number of instructional minutes by one minute and decreasing the number of examples given in each instructional script for each successive script level (e.g. the first script/theme received 5 minutes of discrimination training on vocal stereotypy and 10 examples, the second script/theme received 4 minutes of instruction and 8 examples, etc). The script began with an explanation of appropriate vocalizations and how they may be stated (e.g. talking about things you want, things you see, and things you feel). The script included a rule about vocal stereotypy (e.g., If I am copying something from a TV show or a movie we are not
watching, my words may not be friendly, appropriate words). Following this, the lesson included errorless training on appropriate and inappropriate vocalizations. In the errorless training, the researcher would begin teaching by asking the student questions and giving them the correct answers to respond, which were then faded to let the student determine the correct response independently at the end of the lesson. For example, the teacher might say to the student, “Spongebob, we have to save the secret Crabby Patty Recipe! (pause) Was I copying a TV show or a movie? Yes” followed by an opportunity for the student to respond to the question independently. For further explanation of this teaching method, refer to Appendix C. The script ended with discrimination training questions involving the instructor giving an example of a vocalization and the participant was required to state and/or receptively indicate whether the vocalizations/phrase exhibited by the researcher was appropriate or inappropriate. It should be noted, however, that shortened lessons, modified language, increased student responding, and/or character changes in the script according to student attention and understanding of the lesson’s concepts were used to modify lessons. Instructional sessions followed a script that described various examples and non-examples of vocal stereotypy with active student responding throughout the script. See Appendix C for the entire script.

Preference assessment. Prior to each 10-minute session, a Multiple Stimulus without Replacement Preference Assessment (MSWO) was conducted for the individual to determine the reinforcer that would be used in the DRO for
the subsequent session. An MSWO preference assessment was used because it is one of the more efficient preference assessments that quickly facilitates the identification of the top 2 potential reinforcers from an array when conducted in an abbreviated version (Fisher & Mazur, 1997). The preference assessment was completed each session because individual preferences may change frequently (Fisher & Mazur, 1997).

The preference assessment was conducted by placing five highly preferred items in front of the student. This preference assessment is an assessment that presents an array of preferred items that may be used as reinforcers. The student chose one item per trial (for a minimum of 7 trials), while the chosen item (potential reinforcer) was recorded. The student was presented with 5 items and the item chosen 3 times was removed from the array. The top two items chosen from the preference assessment were selected and offered to the student throughout the treatment sessions as reinforcement for appropriate vocalizations. In addition, the items used in the array in front of the student were determined based on teacher recommendations and observations of the participant. These five items were available for the participant, and the experimenter told the participant to take the item he/she wanted to play with. The experimenter permitted the participant to manipulate his or her chosen item for 30 seconds and the experimenter recorded the chosen item. If the participant chose food, the experimenter gave the participant a small amount of the food item (e.g. 1 pretzel or 1 skittle) and 30 seconds to eat the
item before the next trial began. After 30 seconds, the experimenter placed the chosen item back in the array of items and told the student again to take the item he/she wanted to play with. Once an item was chosen 3 times, that item was removed from the array and noted in a hierarchy list. In other words, the experimenter permitted the learner to choose an item 3 times before she removed the item from the array of choices and created a hierarchy list of reinforcement items. (Appendix A).

**Differential reinforcement of other behaviors (DRO).** Upon completion of a lesson on vocal stereotypy, the researcher began the response interruption redirection portion as well as the differential reinforcement of other behaviors portion of the intervention. In this study, the researcher used a resetting, fixed-interval DRO. That is the DRO was reset whenever a participant engaged in vocal stereotypy, the DRO interval was reset and each interval was for a fixed amount of time. The student was reminded to use contextually appropriate language ("friendly, appropriate words") and his or her back-up reinforcer was specified and agreed upon as determined by the previously completed preference assessment. In addition to this, the DRO contingency was described to the student. Note that the back-up reinforcers used were items that the participants did not have free, unlimited access to in their daily encounters and every back up reinforcer included the opportunity to engage in stereotypy for 30 seconds. After the contingency had been determined, a DRO timer was started.
In the DRO procedure, the student received one token for each fixed interval of time they did not engage in vocal stereotypy. Fixed intervals of time for the DRO were determined on an individual basis, and based on the student’s rates of vocal stereotypy during baseline. Once the student earned 3 tokens for not engaging in vocal stereotypy, the student received his/her pre-determined back-up reinforcer for 30 seconds. Upon receiving a back-up reinforcer, the researcher praised the student for using friendly, appropriate words while simultaneously delivering the pre-determined reinforcer. For example, the researcher might say, “Great job using appropriate, friendly words! Here is [reinforcer], you earned it!” In the reinforcer minute, vocal stereotypy was not measured and this time did not count towards the ten minutes of the instructional session. It should be noted that if a the participant had earned reinforcement, the partial interval recording for that time interval was scored up until the moment the DRO timer ended that DRO interval (e.g. a 20-second interval was scored up until the moment the participant earned his or her third token). If a student did not receive the pre-determined reinforcer within an intervention session, the session concluded with the researcher telling the student why they did not receive their reinforcer and telling the student that they may be able to earn an item of their choice next time if they are able to use appropriate words. For example, the researcher might tell the student, “You did not earn [reinforcer] today because you were doing [form of stereotypy.
exhibited]. Those were not friendly, appropriate words. Maybe next time you can use friendly, appropriate words and earn [reinforcer].”

**Response interruption and redirection.** When a student engaged in vocal stereotypy, the DRO timer was reset with a neutral vocal reprimand and description of the vocal stereotypy following this action (e.g. “no, you are copying TV shows, we need to use friendly words”) and response interruption and redirection was implemented. In this intervention, response interruption required that the student was interrupted with a series of instructor questions while redirection required that the student was provided with a behavior alternative to engage in rather than vocal stereotypy. In the interruption phase, conversational questions were issued by the researcher to the student. For example, when a student engaged in vocal stereotypy, the researcher would ask questions such as “What’s your name? What school do you go to? How old are you? What color is your shirt? etc”, until the student answered 3 questions independently, consecutively, and accurately. It should be noted, however, that the questions used were questions the student had demonstrated fluency in answering through a cold probe prior to the intervention phase. Once the student had answered the question series, the teacher redirected the student to other, contextually appropriate vocalizations, or back to the previous task as determined appropriate by the teacher. For example, the researcher might say, “you can talk about the [activity]” or the researcher might say, “We are doing [activity] right now.” Once the student complied with the researcher’s requests
in the absence of vocal stereotypy, the DRO timer was restarted and the session activity resumed.

Throughout the sessions, the researcher modeled appropriate vocalizations for the student. When the student engaged in appropriate vocalizations, he/she received behavior-specific praise (such as “I like how you're telling me about [activity]!”) and their requests were honored whenever possible.

**Generalization.** Throughout the intervention phase, the student was tested periodically for generalization of the intervention. The students were observed within their daily routine/daily educational environment for 8-10 minutes per observation period to determine his or her rates of vocal stereotypy in regularly scheduled sessions in order to determine if the behavior had generalized outside of the intervention sessions.

**Fading.** Once a student reached steady rates of low vocal stereotypy, the intervention began to be faded. In fading the intervention, response interruption and redirection remained in place upon instances of vocal stereotypy and praise was given intermittently for appropriate vocalizations, with a thinned DRO time schedule. The DRO was thinned based on latency to responding where responding is engaging in vocal stereotypy (Lalli Casey, & Kates, 1997). For example, a student on a 1 minute DRO who is demonstrating steady, decreased rates of vocal stereotypy will have his or her DRO interval increased to 2 minutes, then 3 minutes, etc. Students’ DRO schedules were thinned once the
students demonstrated the ability to meet the fixed interval DRO criterion for three consecutive fixed intervals. In these instances, the DRO time criterion was lengthened by 33%. In other words, a DRO schedule was thinned once the student received 3 tokens consecutively without receiving the response interruption and redirection procedure.

**Staff implementation of RIRD.** Following the removal of the intervention sessions with the researcher, the participants’ teachers were trained on the definition of vocal stereotypy, appropriate vocalizations, and how to implement response interruption redirection. More specifically, staff members were trained to implement RIRD as the researcher did (interrupting the participant and requiring them to answer 3 known questions consecutively and correctly followed by a redirection to appropriate vocalizations). Participants’ teachers took data on instances of response interruption and redirection as well as instances of appropriate vocalizations for the first 15 minutes of every educational session. These data were collated to determine instances of RIRD per minute during teacher interactions as well as appropriate vocalizations during teacher interactions in comparison to RIRD and appropriate vocalizations during intervention sessions with the researcher. Participants’ teachers implemented RIRD throughout their daily routine for no less than 5 sessions.

**Maintenance.** Following the intervention phase, each student was observed periodically for maintenance of the intervention. The students were observed within their daily routine for 8-10 minutes per observation period to
determine their rates of vocal stereotypy in regularly scheduled sessions. This was done to determine if the behavior had maintained after the intervention had ceased. These maintenance probes occurred at least once per week for 3 consecutive weeks beginning the first week after the intervention sessions ended.

**Social Validity**

A graduate student, not connected with the study obtained the social validity data. The graduate student requested each teacher to complete a questionnaire regarding the teacher’s satisfaction with the intervention during and after the intervention had been implemented. The questionnaire contained 13 questions pertaining to the teacher’s perceptions of her student’s language progress as well as a section for suggestions and comments. The experimenter used this information to assess consumer satisfaction, the practicality of the intervention, and identify possible implications for future research. See Appendix J for a sample of the social validity questionnaire.
Chapter 3: Results

This chapter presents the results of the functional behavior assessment, baseline, response interruption and redirection, differential reinforcement of other behaviors, and discrimination training as well as the staff implementation of the intervention. Also discussed are the results of the inter-observer agreement, procedural integrity, and social validity assessments.

Procedural Integrity

Data for the procedural integrity of the intervention phase are displayed in Table 3.1. Treatment integrity data demonstrate that the intervention was implemented correctly 100% of the time. 42% of sessions were tested for procedural integrity. Of that percentage, 44% of Marvin's sessions were assessed with 100% procedural integrity. 45% of Mark's sessions were assessed with 100% of procedural integrity. 29% of Henry's sessions were assessed and calculated to have 100% procedural integrity. 50% of Sara's sessions were assessed and scored 100% procedural integrity. In addition, 40% of the generalization through staff training sessions were assessed for procedural integrity. For these sessions, procedural integrity was calculated to be 100%.
Table 3.1: Mean Procedural Integrity

<table>
<thead>
<tr>
<th></th>
<th>Marvin</th>
<th>Mark</th>
<th>Henry</th>
<th>Sara</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>$4^a$, 100%, 0$^c$</td>
<td>$5^a$, 100%, 0$^c$</td>
<td>$2^a$, 100%, 0$^c$</td>
<td>$3^a$, 100%, 0$^c$</td>
</tr>
<tr>
<td>Staff Implementation</td>
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<td>$2^a$, $100^b$, 0$^c$</td>
<td>$2^a$, $100^b$, 0$^c$</td>
<td>$2^a$, $100^b$, 0$^c$</td>
</tr>
</tbody>
</table>

Note: $^a$ Number of sessions with procedural integrity, $^b$ Percent of procedural integrity, $^c$ Range

Inter-observer Agreement

Inter-observer agreement of the functional behavior assessment.

During the functional behavior assessment, inter-observer agreement (IOA) was conducted for 20% of sessions for each participant. IOA for the perceived function of vocal stereotypy was assessed to be 100% for all participants. See Table 3.2

Inter-observer agreement of RIRD + DRO. For all participants, IOA was assessed for 32% of sessions, including 30% of baseline sessions, 34% of RIRD + DRO sessions. Overall, IOA was 98%. For Marvin, IOA was calculated to be 100% during baseline and 98% during intervention sessions. Mark’s IOA was calculated to be 100% during baseline and 100% during intervention sessions. For Henry IOA was calculated as 100% during baseline and 89% during intervention sessions. Finally, for Sara, IOA was calculated to be 83% during baseline and 100% during intervention sessions. See Table 3.2

Inter-observer agreement of staff implementation of RIRD. Staff implementation of RIRD was assessed for IOA for 40% of sessions. Marvin’s staff implementation IOA was scored 40% of the time and calculated to be 100% agreement. IOA for Mark’s staff was assessed 40% of the time and calculated to
be 94% agreement. 40% of Sara’s staff implementation sessions were assessed for IOA and determined to have 85% agreement. See Table 3.2

<table>
<thead>
<tr>
<th></th>
<th>Marvin</th>
<th>Mark</th>
<th>Henry</th>
<th>Sara</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBA</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Baseline</td>
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<td>100%</td>
<td>100%</td>
<td>83%</td>
</tr>
<tr>
<td>Intervention</td>
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<td>100%</td>
<td>89%</td>
<td>100%</td>
</tr>
<tr>
<td>Staff Implementation</td>
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<td>2\textsuperscript{a}, 85%\textsuperscript{b}</td>
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</tbody>
</table>

\textit{Note:} \textsuperscript{a} Number of IOA sessions, \textsuperscript{b} Percent of IOA

Table 3.2: Inter-observer Agreement

**Functional Behavior Assessment**

**Marvin.** Marvin’s functional behavior assessment indicated that his stereotypy was controlled at least partially by automatic reinforcement. The mean FAST scores for Marvin’s stereotypy included a score of 4 (on a scale of 1-4) for the maintaining function of the vocal stereotypy as sensory stimulation, a score of 3 to escape a situation, a score of 1 to access items, and 0 for pain attenuation. See Table 3.3 In addition, direct observations by trained observers of Marvin’s vocal stereotypy yielded similar results. The maintaining function of his stereotypy appeared to be sensory stimulation occurring in alone conditions an average of 77.6% of the time, 22.6% of the time under demand conditions, 0.8% of the time being under gaining access to tangible items conditions, and 0% of the time under attention conditions. Automatic reinforcement of vocal stereotypy were scored in situations in which Marvin received attention from the researcher and had access to items (such as when he was manipulating a toy object and the instructor was assisting in manipulating the object). Situations
scored as escape from demands occurred immediately after the researcher made a request for Marvin to do something (e.g. “your turn,” “pick a card,” etc.). See Figure 3.1. In addition to the 4 types of stereotypy defined in this study: copying movies/TV, copying others, singing, and non-contextual vocalizations, Marvin consistently engaged in non-contextual vocalizations a majority of the time. See Figure 3.2.

<table>
<thead>
<tr>
<th></th>
<th>Marvin</th>
<th>Mark</th>
<th>Henry</th>
<th>Sara</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention/Preferred Items (social)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
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<tr>
<td>Escape (social)</td>
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<tr>
<td>Pain Attenuation (automatic)</td>
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<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Note: Scores derived from the mean of 3 Functional Analysis Screening Tool (FAST) assessments completed by participants’ teachers. Scores based on a 4-point scale.*

Table 3.3 Participants’ Average total FAST Scores
Figure 3.1: Functional Behavior Assessment Summary of Perceived Functions of Vocal Stereotypy for Marvin

Mark. Mark’s functional assessment indicated that his stereotypy is most likely maintained by automatic reinforcement in most situations, and maintained at times by escape. The mean FAST scores for Mark’s vocal
stereotypy included a score of 4 for the maintaining function likely to be sensory stimulation, a score of 2 for attention and escape functions, and a score of 0 for pain attenuation. Mark’s vocal stereotypy yielded similar results. Vocal stereotypy was maintained by sensory stimulation for a mean of 85.2%, 14.8% maintained by escape. Attention or access to tangible items was recorded 0% of the time. Mark’s instances of stereotypy while receiving attention from the researcher and/or was manipulating an object independently (e.g. reading a book, building a marble run), were scored as perceived automatic reinforcement functions. When Mark was requested to perform a task, he immediately engaged in vocal stereotypy (e.g. “send the marble down”) which was scored as likely maintained by escape. See Figure 3.3. In addition, the type of stereotypy most frequent for Mark was non-contextual vocalizations. See Figure 3.4

Figure 3.3: Functional Behavior Assessment Summary of Perceived Functions of Vocal Stereotypy for Mark
Figure 3.4: Type of Stereotypy exhibited by Mark

**Henry.** Henry’s functional behavior assessment suggest that his vocal stereotypy was likely maintained in large part by automatic reinforcement, and at times by escape or attention. The mean FAST scores for Henry included a score of 4 sensory stimulation, 3 for his behavior likely maintained by access to attention, a 2 for escape, and 0 for pain attenuation. Observations of Henry’s vocal stereotypy indicated a mean of 85.8% maintained by automatic, 8.0% maintained by escape, 2.6% maintained by attention, and 1.2% of the time maintained by access to tangible items. Henry’s vocal stereotypy scored as automatic occurred in situations where Henry was manipulating a toy independently (e.g. playing with Play-Doh with researcher praise followed by vocal stereotypy). Instances of escape were those where the researcher
requested Henry to do something (e.g. “Flatten the Play-Doh like mine”).

Attention was scored when vocal stereotypy ceased at the point of researcher attention. Access to a tangible item was scored situations in which Henry was denied access to manipulating specified items (e.g. “my turn, give it to me”). See Figure 3.5. The type of stereotypy most frequent for Henry was non-contextual language for most sessions, but he also demonstrated high rates of singing and delayed echolalia at times. See Figure 3.6.

![FBA Results for Henry](image)

Figure 3.5: Functional Behavior Assessment Summary of Perceived Functions of Vocal Stereotypy for Henry.
Sara. Sara’s functional behavior assessment results suggest that her vocal stereotypy is largely maintained by automatic reinforcement, but may also have been maintained in part by access to attention and escape. Sara’s mean FAST scores of her vocal stereotypy included a score of 3.5 for sensory stimulation as the maintaining function, a score of 2 for attention being the maintaining function, a score of 1.5 for escape, and a score of 0 for pain. Direct observation of Sara’s vocal stereotypy yielded a mean of 93.6% maintained by automatic reinforcement, 3.6% by escape, 1.8% by attention, and 0% maintained by access to tangible items. Instances in which Sara had non-contingent access to tangible items and had received instructor attention were scored as maintained by automatic reinforcement (e.g. Sara engaged in vocal stereotypy while completing
a puzzle with the researcher). Stereotypy following requests to complete a task or a researcher command was scored as escape from a demand (e.g. Sara was told to read a sentence in a book she was reading with the instructor). Vocal stereotypy that was preceded by the researcher not paying attention to Sara was scored as attention-maintained functions of vocal stereotypy (e.g. Sara was denied access to the researcher’s computer). See Figure 3.7. Sara exhibited all types of stereotypy with consistent high rates of copying movies or TV as well as non-contextual vocalizations. See Figure 3.8.

Figure 3.7: Functional Behavior Assessment Summary of Perceived Functions of Vocal Stereotypy for Sara.
Figure 3.8: Type of Stereotypy exhibited by Sara

**Experimental Data**

**Marvin.** Marvin’s data are presented along with the other participants in Figure 3.9 and Figure 3.10. Marvin’s baseline shows a mean percentage of inappropriate vocalizations at 73.1% (range of 53%-100%), and a mean percentage of appropriate vocalizations at 5.6% (range of 0%-15%). During the intervention phase (RIRD + DRO), Marvin’s rates of vocal stereotypy decreased to an average of 35.4% (range of 14%-70%). Marvin’s appropriate vocalizations increased to an average of 18.6% (with a range of 5%-36%). See Figure 3.9.

The experimenter collected generalization data for Marvin in his typical non-treatment school environment. Baseline data show a mean percentage of inappropriate vocalizations at 93.7% (range of 88%-100%). During intervention, inappropriate vocalizations decreased to an average of 48.3% (range of 45%-

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**Type of Stereotypy Displayed by Sara**

<table>
<thead>
<tr>
<th>Session</th>
<th>Movies/TV</th>
<th>Copy Others</th>
<th>Singing</th>
<th>Non-Contextual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>60</td>
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<tr>
<td>3</td>
<td>40</td>
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<td>40</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>5</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

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68%). Appropriate vocalizations averaged 1.7% (range of 0%-5%) during baseline and increased to an average of 2.8% during intervention (range of 0%-11%). There is a difference between baseline and intervention levels for vocal stereotypy, although the percentages of inappropriate vocalizations tended to increase. The highest rates of appropriate vocalizations occurred during the intervention phase, however it was common for Marvin to engage in 0% appropriate vocalizations in both baseline and intervention sessions. See Figure 3.10.
Figure 3.9: Multiple Probe Across Participants in the Intervention Setting
Figure 3.10: Multiple Probe Across Participants in the Typical Education Environment
During the discrimination training portion of each intervention phase, Marvin was able to meet the mastery criterion to discriminate appropriate and inappropriate vocalizations within 12 sessions. It took him an average of 2 trials/sessions to master each script. See Figure 3.11.

Marvin's preference assessments resulted in Marvin typically selecting to watch a DVD upon the successful completion of a DRO time frame. Marvin began intervention with a 0:30 DRO and completed his intervention phases with 3:45 DRO. It took him on average 1.9 sessions to meet the mastery criterion for a DRO with a range of 1-6 sessions conducted before the mastery criterion was met. The number of sessions needed for Marvin to meet mastery criterion decreased by an average of 1 session per lesson by the end of the intervention phase.

Marvin showed a rapid decrease in direction from the beginning DRO criterion to the DRO settings for the rest of the study. After this initial decrease, Marvin's sessions to DRO mastery criterion remained stable at an average of 1 session necessary to meet the mastery criterion for each DRO. See Figure 3.11.

In the initial sessions of the intervention phase, instances of response interruption and redirection for Marvin were 4.8 times per minute. In the later sessions of the intervention phase, instances of response interruption and redirection for Marvin decreased to 2.0 times per minute. The instances of RIRD show an overall decrease in trend throughout the intervention. Initially, Marvin’s average number if interruptions with staff was 6.7, which decreased to an average of 5.5 interruptions per minute towards the end of the staff
implementation phase. Appropriate vocalizations initially occurred an average of 0.8 times per minute and increased to 0.9 times per minute in the final staff implementation phases, displaying a somewhat steady trend. Marvin shows an initial increase in response interruptions and redirections with the staff implementing RIRD. The number of instances of RIRD per minute, however, show a decreasing trend by the third session with staff in his typical education environment. See Figure 3.12.

Figure 3.11: Script Trials to Mastery Criterion
Figure 3.12: Number of Sessions to DRO Mastery Criterion for Marvin

Figure 3.13: Instances of Response Interruption and Redirection per Minute and Appropriate Vocalizations per Minute for Marvin
**Mark.** Mark’s baseline data with the researcher (displayed in Figure 3.9) show the mean percentage of inappropriate vocalizations as 77.1% (range of 41%-100% engagement in vocal stereotypy). In the intervention phase, Mark’s average percentage of engagement in inappropriate vocalizations decreased to 49.6% (range of 17%-85%). During baseline, appropriate vocalizations occurred on average 5.6% (with a range of 0%-15%). Appropriate vocalizations averaged for 4.7% of vocalizations (range of 0%-11%) during the intervention phase. Inappropriate vocalizations show an overall downward trend throughout the intervention and a significant downward trend in the latter half of the intervention phase. Appropriate vocalizations do not show a change in trend, level, or variability between baseline and intervention; furthermore, they tended to remain at 0% throughout the entire study. See Figure 3.9.

In Mark’s typical education environment (sessions in which he was observed in his daily learning environment without the implementation of RIRD and DRO), his baseline percentages of inappropriate vocalizations were an average of 80.7% (range of 71%-94%). During typical environment observation sessions, Mark’s baseline percentage of inappropriate vocalizations decreased to 74.6% (range of 50%-97%). This data decreased substantially after several intervention sessions; however, it briefly increased back to baseline levels and declined for the remainder of the intervention. Baseline data for appropriate vocalizations were calculated to be a mean of 3.3% (range of 0%-7% of vocalizations). Appropriate vocalizations in this setting increased to an average
of 13.4%. Appropriate vocalizations in this environment initially showed an increase in trend between baseline and intervention, but declined in trend towards the end of the study. See Figure 3.10.

Mark completed 2 of the 4 discrimination training lessons on vocal stereotypy, but did not meet the mastery criterion for the third script, thus did not progress. Mark took an average of 4 sessions to master a lesson. Mark received the script training for every intervention session with the researcher for a total of 10 sessions. The difficulty in lesson mastery may be due to Mark’s interest in the “not friendly words” picture card, causing a selection bias and errors in mastery trials. See Figure 3.11.

As indicated by Mark’s preference assessments, Mark selected balloons most frequently as a reward for using “friendly words” during the intervention phase. Mark began his intervention sessions with a 0:21 DRO that increased to a 1:04 DRO at the end of the intervention phase. Mark took an average of 2.8 sessions to master a DRO criterion. Mark did not demonstrate a significant change in level or trend in his acquisition and mastery of a DRO criterion. This is demonstrated by similar levels and variability throughout the DRO sessions introduced during the intervention phase. See Figure 3.14.

Mark showed a decreasing trend in instances of RIRD throughout the intervention session with a significant change in level of instances of RIRD with little variability. Initially, Mark’s rate of RIRD was an average of 10.2 times per minute, but decreased to an average of 3.8 times per minute in the final sessions.
The average instances of RIRD per minute during the staff implementation of RIRD were 6.8, which decreased in the final phases to an average of 4.0.

Appropriate vocalizations on average remained at 0.3 times per minute throughout the staff implementation of RIRD. Initially, Mark showed a steady decreasing trend during the staff implementation of RIRD, but this phase showed a decrease in interruptions per minute in the final sessions. Appropriate vocalizations with staff implementation of RIRD remained steady and low. See Figure 3.15.

![Trials to Mastery Criterion for Mark](image)

Figure 3.14: Number of Sessions to DRO Mastery Criterion for Mark
Henry. In Henry’s baseline data with the researcher (Figure 3.9), the average baseline percentage of inappropriate vocalizations was 54.7% of vocalizations (range of 31%-100%). During the intervention phase, Henry displayed a decrease in inappropriate vocalizations for an average of 38.4% (range of 4%-58%). His baseline data for appropriate vocalizations was calculated to be 2.7% of vocalizations (range of 0%-9%). This data increased to an average of 8.6% appropriate vocalizations in the intervention phase (range of 0%-24%). During Henry’s baseline for inappropriate vocalizations, the data presented some variability initially, but baseline ended with a steadily increasing trend with Henry engaging in inappropriate vocalizations 100% of the time for the last baseline session. Baseline data for appropriate vocalizations remained at 0%.
0% throughout most of the baseline phase, with an increasing trend towards the end of the baseline phase. During the intervention phase, appropriate vocalizations decreased in trend throughout this phase, with slight increases upon the introduction of a new DRO criterion, followed by a decrease in percentage for inappropriate vocalizations. Appropriate vocalizations during the intervention phase increased initially, but overall showed a decreasing trend throughout the phase. See Figure 3.9.

When Henry was observed in his typical education environment without the implementation of RIRD +DRO, his baseline percentage of inappropriate vocalizations was 41% (range of 19%-61%). During the intervention phase, his level of inappropriate vocalizations decreased to an average of 27.8% (range of 5%-44%). In the intervention phase, inappropriate vocalizations also had some variability, but seemed to be increasing in trend. Henry's baseline percentage of appropriate vocalizations was 7.5% (range of 4%-13%). His appropriate vocalizations during the intervention phase were 4.75% (range of 0%-10%). The baseline levels for this phase include some variability for inappropriate vocalizations but increased to a higher level towards the later baseline sessions. Appropriate vocalizations in the baseline phase remained stable in the 0%-10% range. The data for appropriate vocalizations during the intervention phase increased slightly initially, but remained steadily in the 0%-10% range. Inappropriate vocalizations during the baseline phase in the typical education environment showed considerable variability with no clear trend, while
appropriate vocalizations during baseline had no trend and remained steady at 0%. Inappropriate vocalizations in the intervention phase initially present a decreasing trend, but increased in the last intervention session. Appropriate vocalizations during the intervention phase initially increased slightly, but remained steady and similar to baseline levels. See Figure 3.10.

Henry did not meet mastery criterion for any of the discrimination training lessons. He received discrimination training for the first lesson, “Copying TV shows or Movies” each intervention session with the researcher for a total of seven sessions. See Figure 3.11.

Henry took an average of 1.2 sessions to meet the DRO mastery criterion. His DRO mastery criterion for the first session was a 30 second DRO, which took him 2 sessions to master. For all of the following sessions, Henry took 1 session to master the DRO criterion, with a DRO criterion of 1:36 for the final intervention phase. See Figure 3.16.

Instances of RIRD per minute for Henry began with 8.6 interruptions per minute initially for the 30 second DRO. The interruptions per minute decreased throughout the intervention phase and for each DRO criterion. The final intervention session was 0.7 interruptions per minute. Due to Henry moving out of the country, the staff implementation of RIRD was not possible. See Figure 3.17.
Figure 3.16: Number of sessions to DRO mastery criterion for Henry.

Figure 3.17: Instances of Response Interruption and Redirection per Minute and Appropriate Vocalizations per Minute for Henry

**Sara.** Sara’s baseline data with the researcher showed an average of 79% of vocalizations as inappropriate (range of 4%-29%). During the intervention
In baseline sessions for the typical learning environment, Sara’s inappropriate vocalizations occurred an average of 74.7% of the time (range of 52%-92%). Upon the implementation of the intervention with the researcher, Sara’s inappropriate vocalizations in her typical learning environment decreased to an average of 31% (range of 10%-50%). Sara’s appropriate vocalizations during baseline in the typical educational environment occurred an average of
14.3% of the time (range of 7%-25%). Her appropriate vocalizations during the intervention phase occurred an average of 12.8% of the time in the typical education environment (range of 0%-32%). Sara’s baseline data for inappropriate vocalizations show an increasing trend, followed by a decrease upon the introduction of the intervention phase with the researcher. The inappropriate vocalizations during the intervention phase show an overall increase in trend; however, levels remain lower than those during baseline.

Appropriate vocalizations during the intervention phase show an increasing trend. Upon the introduction of the intervention with the researcher, Sara’s appropriate vocalizations decreased initially. These vocalizations continued to increase throughout the intervention and show the highest percentage of appropriate vocalizations occurred at 32% of the time. See Figure 3.10.

Sara met the mastery criterion for all 5 vocal stereotypy discrimination training lessons within 8 sessions, of which Sara took an average of 2 sessions to achieve the mastery criterion. See Figure 3.11.

Sara’s DRO for the beginning session was 21 seconds, which increased to 38 seconds by the final intervention session. Sara took an average of 1.7 sessions to master each DRO criterion. Initially, Sara took longer to master a DRO criterion, but took fewer sessions to master a DRO criterion towards the end of the intervention phase, as displayed by a decreasing trend. See Figure 3.18.
Sara’s instances of RIRD per minute were initially 8.8 times per minute, but decreased to an average of 5.6 times per minute in the final intervention sessions. The overall trend for Sara’s instances of RIRD per minute show a steady decrease. During the staff implementation of RIRD phase, the average instances of interruptions per minute was 3.1, which decreased to an average of 1.7 interruptions per minute in the final sessions of this phase. Sara's instances of appropriate vocalizations per minute displayed a steady decrease and continued to decrease from levels during the researcher’s implementation of THE INTERVENTION. Appropriate vocalizations remained steady at an average of 0.3 instances per minute throughout the staff implementation of RIRD. See Figure 3.19.
Social Validity

Following the intervention and research extension, six of the participant's classroom teachers and behavior technicians (center-based ABA therapists) were asked to rate the social validity of the procedures used. The researcher asked classroom teachers to answer questions in a survey regarding the necessity of the intervention as it relates to the participants’ attention during instruction, peer interactions prior to and following the implementation of the intervention procedures, and the likelihood that they would utilize some or all of the intervention procedures with consumers in the future. See Table 3.4. For questions regarding the comparison of attention and peer interactions, the rating scale was as follows: 1- never, 2- less than peers, 3- about the same, 4-
more than peers, 5- almost constantly. For questions regarding the necessity of the intervention, the rating scale was as follows: 1- very necessary, 2- somewhat but not imperative, 3- neutral, 4- mostly, 5- very necessary. For questions regarding the likelihood of implementing the intervention in the future, the rating scale was as follows: 1- never, 2- with changes, 3- maybe, 4- probably, 5- anytime.
<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.) Prior to the intervention, please rate the individual’s rates of vocal</td>
<td>5</td>
</tr>
<tr>
<td>stereotypy in comparison to their “typical” peers.</td>
<td>almost constantly</td>
</tr>
<tr>
<td>2.) After the intervention, please rate the individual’s rates of vocal</td>
<td>4.5</td>
</tr>
<tr>
<td>stereotypy in comparison to their “typical” peers.</td>
<td>more than peers-</td>
</tr>
<tr>
<td>almost constantly</td>
<td></td>
</tr>
<tr>
<td>3.) Given the individual’s peer interactions prior to the intervention, how</td>
<td>5</td>
</tr>
<tr>
<td>necessary did you find the implementation of the intervention to be?</td>
<td>very necessary</td>
</tr>
<tr>
<td>4.) Given the individual’s instructional attention prior to the intervention,</td>
<td>5</td>
</tr>
<tr>
<td>how necessary did you find the implementation of the intervention to be?</td>
<td>very necessary</td>
</tr>
<tr>
<td>5.) How would you say the individual’s social interactions with peers have</td>
<td>2.3</td>
</tr>
<tr>
<td>improved from this intervention?</td>
<td>somewhat, but not a</td>
</tr>
<tr>
<td>6.) How would you say the individual’s instructional interactions and/or</td>
<td>2.5</td>
</tr>
<tr>
<td>attention has improved from this intervention?</td>
<td>somewhat, but not a</td>
</tr>
<tr>
<td>7.) Please rate how easily you understood the intervention.</td>
<td>4.3</td>
</tr>
<tr>
<td>8.) Please describe how willing you would be to implement this intervention</td>
<td>4.5</td>
</tr>
<tr>
<td>in the future?</td>
<td>probably- anytime</td>
</tr>
</tbody>
</table>

Note: Results of the social validity assessment of the experimental procedures reported by classroom teachers

Table 3.4: Summary of Social Validity Assessment

Teachers and behavior technicians who completed the assessment stated that the participants used in the study engaged in vocal stereotypy almost constantly in comparison to their “typical” peers (average score of 5). In
comparison to their typical peers, participants’ rates of vocal stereotypy occurred more than peers or almost constantly (average of 4.5). In considering participants’ peer interactions prior to the intervention, teachers and behavior technicians felt the intervention was very necessary (average social validity score of 5). In considering participants’ instructional attention, prior to the intervention, teachers and behavior technicians felt the intervention was very necessary (average score of 5). Teachers reported that the participants’ interactions with peers improved somewhat, but not a lot or remained neutral in response to this question (average score of 2.3). In addition, teachers reported similar results when asked how participants’ instructional attention improved following the implementation of the intervention (average score of 2.5). Teachers were asked the degree to which they understood the intervention procedures and reported that they mostly understood the procedures or they understood the procedures very clearly (average score of 4.3). When asked if teachers and behavior technicians would use similar procedures in future educational situations, they stated they would probably be likely to use the intervention or would use it anytime (average score of 4.5) to utilize the procedures of this study.
Chapter 4: Discussion

This chapter discusses the results of the intervention relative to research questions, addresses the limitations of the study, and suggests implications for the implementation of the procedures in clinical settings as well as offers recommendations for future research.

Data from the functional behavior assessments conducted prior to the intervention phase indicated that all participants’ inappropriate vocalizations were maintained at least partially by automatic reinforcement, which served as a primary function for all participants. During treatment, all participants’ rates of vocal stereotypy decreased steadily to lower than baseline levels. These findings are consistent with previous studies demonstrating that response interruption and redirection or the use of differential reinforcement of other behaviors can reduce vocal stereotypy (Ahearn et al., 2003; Ahearn et al., 2007; Conyers et al., 2004). Another finding was that, with the exception of Mark, the participants’ acquisition rates of new DRO mastery criteria increased following the first DRO phase. These data indicate that the intervention increased in effectiveness once participants became aware of the response contingencies. That is, participants were able to refrain from engaging in vocal stereotypy for longer amounts of time between episodes of vocal stereotypy as the intervention progressed. Mark’s acquisition rates for the DRO criterion remained variable around a level
of 3 sessions per criterion. This may be due to ratio strain from the DRO criterion increasing too rapidly. More specifically, the criterion set for Mark may have been too high of a goal. This may have caused him not to access reinforcement as often as necessary and thus continue to engage in high rates of stereotypy.

All participants showed an increase in appropriate vocalizations at various times during the intervention; however, this change was not consistently maintained. For example, Marvin, Henry, and Sara all demonstrated an increasing trend in rates of appropriate vocalizations as well as the highest percentage of appropriate vocalizations during the intervention phase. The rate of appropriate vocalizations, however, presented some variability with a decreasing trend towards the end of the intervention phase for Marvin and Henry. The increases in appropriate vocalizations during the intervention sessions may be due to increased establishing operations (EO’s) or motivation for the reinforcing items present for a participant's reward for successful completion of a DRO time frame. These data are consistent with previous research demonstrating that appropriate vocalizations may be a beneficial “side effect” of the use of response interruption and redirection procedures (Ahearn et al., 2007).

Generalization was recorded but not under controlled conditions. The staff implemented the intervention in the participants’ typical educational environment following the clinical implementation of the intervention (RIRD,
DRO and discrimination training procedures. The staff members/teachers of the participants identified and recorded instances of vocal stereotypy and appropriate vocalizations as well as used RIRD to reduce rates of vocal stereotypy. Staff members showed success in decreasing rates of vocal stereotypy with high rates of treatment integrity. This is important in considering the generalization of the implementation procedure from clinical settings to natural settings. It is speculated that the intervention would not have been as effective in the typical education setting had it not been originally introduced in a clinical setting and then programmed to generalize.

Discussion of results by research question

Research Question 1: What effects will combining discrimination training, response interruption and redirection, and differential reinforcement of other behaviors have on the reduction of rates of vocal stereotypy in individuals with Autism Spectrum Disorder? For all participants, the combination of discrimination training, response interruption and redirection and differential reinforcement of other behaviors had a decreasing effect on rates of vocal stereotypy to levels substantially lower than those during baseline. These decreases occurred even while systematically increasing the DRO criterion. Although there was some variability and instances of increased vocal stereotypy during intervention, these increases typically occurred at times when a DRO criterion was increased. Following the initial increase in a DRO criterion and an increase in rates of vocal stereotypy, the vocal
stereotypy rates tended to decrease in the following sessions. This pattern may be explained as being similar to a slight ratio strain, which occurred until the participant was able to contact the new schedule of reinforcement controlling the DRO procedure. This may be explained by the fact that rates of inappropriate behavior may be extremely sensitive to changes in reinforcement schedules (Lerman, Iwata, Shore, & Kahng, 1996). These results may be expected because increases in problem behavior are commonly observed while a schedule of reinforcement is being thinned, but the terminal schedule of reinforcement can be attained while problem behavior is kept to a low level (Hagopian et al., 2007). Most participants, excluding Mark, showed resistance in mastering the DRO criterion during initial DRO criterion sessions; however, the data tended to show a rapid DRO mastery criterion acquisition rate following mastery of the first DRO criterion. Supporting this finding is the idea that fixed-lean schedules of reinforcement in thinning procedures support rapid acquisition of pro-social target behaviors being taught (Hagopian et al., 2004).

The decrease in vocal stereotypy is further supported by each participant’s instances of response interruption and redirection occurring at decreasing rates throughout the intervention phase with the highest instances of RIRD occurring within the first two sessions and the lowest rates of RIRD occurring within the final intervention session for all participants. Additionally, each participant successfully increased the time between inappropriate vocalizations, facilitated by steady increases in the length of DRO time frames. It
should be mentioned, however, that the effect of discrimination training is unclear in a participant’s success in decreasing rates of vocal stereotypy, nor did it illustrate a clear difference in participant’s success in increasing rates of appropriate vocalizations. Following are analyses of this research question with each participant in terms of their rates of vocal stereotypy upon the implementation of the intervention procedures.

**Marvin.** As Marvin’s rates of vocal stereotypy increased, his rates of motor stereotypy (as displayed by hand flapping in front of his face) seemed to increase. This suggests that as vocal stereotypy decreases, other forms of stereotypy that serve automatic reinforcement functions may increase. Hagopian et al., (2004) reported similar findings.

**Mark.** Discrimination training for Mark was only minimally successful in that he was only able to complete 2 out of the 4 lessons. Mark’s struggle in completion of the lessons may have been due to his interest in the “not friendly words” visual prompt. Mark's teachers reported a history in Mark enjoying sadness in others, while the visual prompts included a happy group of people talking for “friendly words” and a sad-looking or bored person depicted for “not friendly words.” Mark tended to select the “not friendly words” card significantly more often while vocalizing “friendly words” during the discrimination training, despite his ability to discriminate between the two cards. Researchers were unable to complete the discrimination training without the picture prompts, however, due to Mark’s lack of clarity in his vocalizations.
Although Mark's success with the discrimination training lessons was minimal, his data still showed decreasing trends in vocal stereotypy during intervention. The spike in vocal stereotypy occurred on a day with notably higher aggression. This spike may be due to Mark's mood or aggression on that particular day in addition to the increase in the DRO criterion. Despite response variability in the acquisition of the DRO mastery criterion, Mark continued to require fewer instances of RIRD throughout the intervention phases that Mark was able to acquire control over his stereotypy.

**Henry.** Although Henry was unable to complete any of the discrimination training lessons, he had steady decreases in rates of vocal stereotypy, suggesting that for some students, discrimination training on vocal stereotypy may not be necessary.

**Sara.** Sara completed the discrimination training lessons faster than her peers and seemed to have a strong knowledge of vocal stereotypy. This is based on the fact that Sara tended to interrupt her own stereotypy by repeating “no” during the intervention before the researcher could implement the RIRD. Sara declined in vocal stereotypy declined even though she had fewer instances of RIRD.

**Summary.** All participants showed substantial decreases in vocal stereotypy following the implementation of discrimination training, response interruption and redirection, and differential reinforcement of other behaviors. This is displayed through all data collected including the percentage of
inappropriate vocalizations emitted per session, the number of sessions taken to
master a DRO criterion, and the instances of RIRD per minute each session. The
relative effects of each of these treatment components on vocal stereotypy
remains unclear and further research is needed for this purpose.

Research Question 2: What effects will combining discrimination
training, response interruption and redirection, and differential
reinforcement of other behaviors have on rates of contextually
appropriate vocalizations in individuals with Autism Spectrum Disorder?

Appropriate vocalizations following intervention are less pronounced compared
to the reduction in vocal stereotypy. The acquisition of higher rates of
appropriate vocalizations were found with 3 of the 4 participants, but these
changes were minimal and varied in level and trend. One possible reason for the
difference in the rates of appropriate vocalizations across participants may be
due to the participants’ familiarity with token systems through a DRO procedure
and delayed reinforcement. Some participants requested reinforcing items
throughout the intervention session, while other participants only requested the
third token which they knew could be exchanged for a back-up reward. The
participants with previous exposure and more familiarity to token
reinforcement systems may have had lower rates of appropriate vocalizations
due to the third token functioning as a discriminative stimulus for
reinforcement. Participants with less familiarity with token systems (e.g.,
Marvin) initially responded to each token as the opportunity for rewards. As
they became familiar with the system, they realized there were fewer opportunities for rewards than tokens and vocalizations dropped accordingly. This problem might have been avoided if rewards were administered intermittently.

**Mark.** Appropriate vocalizations for Mark remained similar to baseline levels with many sessions containing 0% appropriate vocalizations. One particular session, Mark reached higher levels of appropriate vocalizations at 11%. This session contained higher levels of aggression for Mark, though, and most of his appropriate vocalizations were verbally aggressive. One possible reason for Mark’s low rate of appropriate vocalizations may be due to overgeneralization of the intervention to all vocalizations rather than just inappropriate vocalizations.

**Henry.** Initially, Henry engaged in more appropriate vocalizations with the researcher during the intervention phase; however, these levels of vocalizations decreased to baseline levels as well. It should be noted, though, that Henry’s high rates of appropriate vocalizations tended to be requests for reinforcing items that were reserved for the DRO back-up reinforcer. Once Henry had frequent exposure to the contingencies of the DRO, he may have ceased in requesting items because he was able to determine when they items were and were not available without needing to request.

**Sara.** Appropriate vocalizations seemed to increase slightly for Sara throughout the intervention phase, but levels of appropriate vocalizations did
not reach the highest level of appropriate vocalizations during the baseline phase. Sara’s appropriate vocalizations, however, frequently continued to be portions of vocal stereotypy, which fit contextually into the activity she was engaged in at that moment. For instance, while playing with Play-Doh, Sara might make a favorite TV show character and begin to act out the TV show as she was creating the character. Another example of this would be an instance in which Sara played a fishing game with the researcher. Upon her fish getting stuck in a slot, Sara yelled, “He’s stuck! Oh no! What are we going to do?” (a common phrase repeated by Sara from a favorite cartoon). As reported by classroom teachers, this is not an uncommon way for Sara to express herself appropriately and within the context of environmental activities. This suggests that vocal stereotypy or repetitive vocalizations may, at times, serve a social function for the individual.

**Summary.** Appropriate vocalizations showed slight increases for Marvin, Henry, and Sara initially, but steady gains in appropriate vocalizations were not demonstrated through the use of procedures such as discrimination training, response interruption and redirection and differential reinforcement of other behaviors. As noted previously, the most likely reason for the initial increase and subsequent decrease in appropriate vocalizations may be due to the participants’ familiarity with the token systems, tending to respond mainly when they expected to be rewarded.
Research Question 3: What effects will combining discrimination training, response interruption and redirection, and differential reinforcement of other behaviors have on the generalization of reduced vocal stereotypy and/or increased rates of contextually appropriate vocalizations across settings, time and/or teachers? The researcher observed participants in their typical education setting without the intervention. Three of the four participants demonstrated some carryover effects of the intervention to their typical educational environment at least in the first session following the implementation of the intervention. The researcher observed decreases in vocal stereotypy when the intervention began, but these effects did not persist throughout the intervention phase. Two of the four participants showed slight increases in appropriate vocalizations when the intervention began, but these effects decreased for one of the two participants by the end of the intervention. Participants may have been more resistant to change in the generalization setting due to an intermittent schedule of reinforcement (e.g. automatic reinforcement received at times during typical education setting, while other times vocal stereotypy is interrupted and automatic reinforcement is not available). Intermittent schedules of reinforcement typically increase resistance to extinction (Lerman, et al., 1996).

**Summary.** Overall, the implementation of the intervention with the researcher seemed to have no lasting effect on the participants in their typical educational environment. Three of the four participants showed decreases in
vocal stereotypy in their typical educational environment during the intervention as well as two of the four participants showed minimal increases in appropriate vocalizations. These results, however, are temporary and do not last over time. The lack of generalization to non-treatment settings points to the need to teach the desired behavior in multiple settings, especially where you want the behavior to occur.

**Research Question 4: How will teachers respond to response interruption/ and redirection and differential reinforcement of other behaviors procedures (as measured by a social validity questionnaire)?**

Contrary to the results from the intervention carrying over to other situations and environments following implementation of the intervention with the researcher, training teachers on a portion of the intervention did demonstrate successful decreases in vocal stereotypy. Following the removal of the intervention, the researcher met with teachers to instruct them on how to define appropriate and inappropriate vocalizations, as well as how to implement RIRD for the students in the same way the researcher had implemented RIRD. Teachers were asked to role-play how to implement the intervention and take data. Teachers reported overall decreases in inappropriate vocalizations and positive effects for their students (e.g. increased attention during academic programs). For all participants, instances of response interruption and redirection per minute decreased across sessions with their typical education teachers, resulting in less effort required by the teachers to reduce participants'
rates of vocal stereotypy. This data, however, seemed to be more effective in reducing vocal stereotypy with more obvious results when implemented with differential reinforcement procedures, at least for 2 of the 3 participants who received the staff implementation of RIRD.

Classroom teachers generally found the procedures of the intervention to be effective and necessary for the participants involved. Throughout the intervention, classroom teachers frequently complimented and inquired about the intervention. Several teachers requested to be trained on response interruption and redirection for 3 of the 4 participants. Results from the social validity questionnaire indicated that they deemed the intervention to be very necessary for all participants. They noted some improvement in rates of vocal stereotypy; however, they also reported that the participants’ vocal stereotypy still occurred more often than their typical peers.

Following training teachers stated that they understood the procedures of the intervention well and were able to implement RIRD successfully. Teachers did, however, express concerns about the labor intensiveness of the differential reinforcement of other behaviors procedure for participants whose DRO mastery criterion was less than 1-2 minutes. One teacher (for Mark) noted that although RIRD was easily implemented, it did not seem to be effective for him without the use of a DRO. Data do show that RIRD was effective, but only minimally, in comparison to the use of the intervention for Mark. This is consistent with the necessity of reinforcement procedures when teaching
behaviors to reduce or increase (Cooper et al., 2007). Other teachers noted that they believed their students would have improved more if the intervention had been conducted for a longer period of time with more sessions.

Although social validity relative to generalization of the intervention was not measured, there is some anecdotal evidence supporting the use of the intervention in the participants’ homes. Following the intervention, Sara’s mother inquired about using the procedures at home with Sara. Sara’s mother reported support of the intervention and requested to be trained on the intervention to decrease Sara’s vocal stereotypy in the home.

**Limitations**

There are several limitations to the study. One limitation is the use of the DRO procedure, which required low DRO intervals and a low DRO criterion, at least initially. This low criterion was necessary for the success of the DRO criterion so that individuals were able to gain access to the contingencies of reinforcement; however, this intervention is not easily implemented in a clinical or classroom setting with such low DRO intervals is unlikely.

Another limitation of the study includes the time of day the intervention was implemented. All baseline and intervention sessions were conducted at the same time of day for all participants (after lunch, early afternoon). It is possible that stereotypy varied throughout the day, but this study was limited in the times of day stereotypy was recorded. Teachers did comment informally that
vocal stereotypy for participants was “constant” and rates of stereotypy did not seem sensitive to the time of day.

Finally, a limitation to the study is the fact that vocal stereotypy decreased with the implementation of the intervention procedures; however, an appropriate replacement behavior and/or appropriate vocalizations only increased minimally. In the reduction of vocal stereotypy, the participants need to be taught effectively appropriate replacement behaviors and appropriate vocalizations should not be decreased or discouraged. The use of choice responding and allocating responding to matched stimulation may be a beneficial factor in researching replacement behaviors for vocal stereotypy (Fisher et al, 1997). A more appropriate replacement behavior or more effective way to increase appropriate vocalizations is necessary to decrease vocal stereotypy for long term and without the need of a continuous intervention for the participants.

**Implications for Practice**

The current study has implications for practice that may benefit classroom teachers and students alike. Vocal stereotypy may be inappropriate in nature as well as have adverse affects on learning and social stigmatization (Cunningham et al., 2007; Lovaas et al., 1973). Response interruption and redirection as well as differential reinforcement of other behaviors are both outlined as evidence based practices according to Odom et al., (2010). The use of response interruption and redirection has extensive research as it relates to
motor stereotypy, but may also be used successfully as a cost-effective intervention to reduce rates of vocal stereotypy as well as train alternative vocalizations through the use of redirection.

The use of this intervention suggests improvements in attention and decreases in social stigma, resulting in increased opportunities for social interaction and employment for individuals with autism and other disabilities. In addition, the use of the procedures used may be relatively simple for practitioners to use in classrooms or individualized settings. Furthermore, the use of the DRO provides opportunities for the student to select possible alternative or matched forms of stimulation that may produce a higher quality of reinforcement than the problem behavior (Fisher & Mazur, 1997). An example of this is a student choosing to earn the opportunity to watch a clip of a favorite TV show rather than engaging in vocal stereotypy that repeats previously heard conversations from that particular TV show. Furthermore, the use of a DRO is practical to use in group or 1:1 ratios, and the use of response interruption may be used as a natural environment cue to be implemented by practitioners or peers. In addition, the use of the intervention procedures demonstrate a relatively quick acquisition rate for students, thus may require minimal effort for practitioners to implement.

**Recommendations for future research**

Data from this study suggests many directions for future research. First, future research may focus on generalization of the intervention across settings.
and/or fading of the intervention. Researchers should determine appropriate ways for fading the intervention and increasing the likelihood that students come into contact with natural sources of reinforcement from engaging in appropriate vocalizations rather than artificial reinforcement from the DRO token system.

The staff implementation of the intervention showed some success that may further create a basis for future research. It may be beneficial to focus on staff training and use of the intervention in classroom and naturalistic educational settings.

Another suggestion for future research includes effective ways to increase or utilize the DRO in a classroom environment that will be less labor-intensive for classroom teachers. Students who require DRO time criterion that are less than 2 minutes may not be able to receive the use of a DRO as a reinforcement-based intervention to teach the student to reduce vocal stereotypy and/or increase appropriate vocalizations.

Fourth, researchers may focus future studies on teaching the acquisition of pro-social or appropriate vocalizations to individuals who display vocal stereotypy and/or appropriate replacement behaviors. Individuals who are taught to decrease a behavior should be taught appropriate replacement behaviors. For individuals who engage in vocal stereotypy, a replacement behavior may include engaging in appropriate vocalizations, discriminating in appropriate and inappropriate times to engage in the vocal stereotypy, or
identifying sources of matched stimulation. Future research should focus on identifying appropriate replacement behaviors for vocal stereotypy.

Finally, future research may examine the effects of the reduction of vocal stereotypy on task completion. It has been stated that vocal stereotypy results in inattention (Cunningham et al., 2007; Lovaas et al., 1973). Future studies aimed at decreasing vocal stereotypy should aim to assess the benefits of this by measuring task completion or attention to teachers, peers, or others within their environment.

**Summary**

Decreasing rates of vocal stereotypy in individuals with autism can increase opportunities for peer interaction as well as social reinforcement. The reduction of vocal stereotypy may result in increased task completion, attention, and higher learning acquisition rates (Ahearn et al., 2007). Stereotypy is one of the three diagnostic criteria for Autism Spectrum Disorder (Cunningham et al., 2007; Lewis et al., 1998). By decreasing this behavior, individuals may become less stigmatized and increase opportunities for success in community involvement. Teaching individuals to identify forms of vocal stereotypy may increase their ability to monitor their own behavior. Also, the use of differential reinforcement of other behaviors is an effective method to not only promote appropriate behavior, but also to help learners to discriminate conditions for various vocalizations. Lastly, the use of response interruption and redirection is
a simple intervention procedure that can be used naturally throughout settings
to encourage an individual to replace his/her vocal stereotypy with an
appropriate, incompatible behavior, and instruct the individual on selecting
appropriate conversational topics.

Vocal stereotypy can have strong adverse affects on education as well as
social functioning. The use of evidence-based procedures to decrease vocal
stereotypy may improve the independent functioning of individuals with autism
and other developmental disabilities.
References


Appendix A: Functional Behavior Assessment Data Collection Sheet
Appendix B: Functional Behavior Assessment Interview
Functional Behavior Assessment Interview

Student’s Name: ______________________________________
Date:________________________

Relation to student:____________________________________

1. Describe the student’s vocal stereotypy.

2. How often does the student engage in vocal stereotypy?

3. How long does the student’s vocal stereotypy last?

4. What is happening when the behavior typically occurs? (include when and where the behavior is likely to occur if possible).

5. What usually happens immediately after the student engages in vocal stereotypy?
6. Where or when is the vocal stereotypy least likely to occur?

7. Why do you think the student engages in vocal stereotypy? More specifically, do you think it is to get or avoid something?

8. How does engaging in vocal stereotypy affect the student (negative and/or positive affects)?

9. Would you recommend for this student to receive intervention to possibly reduce his or her rates of vocal stereotypy?

Appendix C: Discrimination Training Script for Vocal Stereotypy
Discrimination Training Script for Vocal Stereotypy

Key: Teacher Statements, Student Statements, Student and Teacher Statements

Instructions: The instructor reads the script in orange. The blue writing shows when students should respond. Writing in black gives instructions and guidelines to use while following the script. If a student errors in responding to a correction, use the error correction procedure outlines below the question the student misses.

Mastery Criterion: Students must answer 75% or more questions correctly in the discrimination training sessions in order to reach mastery. If a student does not reach mastery by the end of a lesson, they must repeat the lesson in the following session.

Script 1: Copying TV Shows and Movies

Introduction
Today we are going to learn about talking to other people. When we talk to other people, it is important to use friendly, appropriate words, so other people can talk to us too. Friendly, appropriate words are words that tell people how we feel, what we want, and things we see right now. Sometimes, we use words that are not friendly and appropriate. When we use these words, other people do not know what we are talking about and they cannot talk to us.

Rule 1: Copying tv shows and movies
We are going to talk about words that are not friendly. Here is a Rule: If you are talking about a tv show or movie we are not watching right now, your words are not friendly. Again, here is the rule: If you are talking about a tv show or movie we are not watching right now, your words are not friendly. Lets say the rule together: If you are talking about a tv show or movie we are not watching right now, your words are not friendly.

Copying words from movies and tv shows when we are not watching a movie or tv show is not friendly or appropriate.

When I am talking to my friends or teachers and I am not watching a tv show or movies, it is not okay to copy words from tv shows or movies.
I can talk to my friends or teachers about things that I see and things that we are doing right now, but if I am not watching a tv show or a movie, I should not repeat words I hear in tv shows or movies.

**Rule 1 examples**

a.) Here is an example:
Say the rule with me: **If you are talking about a tv show or movie we are not watching right now, your words are not friendly.**
Copying a tv show or a movie happens when I say things I have seen on tv, such as “Baby Bop, do you want to play with me? Oh! Barney, I love to play with you and your friends!”
Baby Bop is not anything that I can see right now and my friends don’t know what I am talking about when I say this, so these are not friendly, appropriate words.
My turn: Is Baby Bop something we can see right now? No
Your turn: Is Baby Bop something we can see right now? *(no)*
My turn: So can we talk about Baby Bop right now? No
Your turn: So can we talk about Baby Bop right now? *(no)*

b.) Here is another one.
Say the rule with me: **If you are talking about a tv show or movie we are not watching right now, your words are not friendly.**
Copying a tv show or a movie might also happen when I say, “Oh no! Minnie Mouse! Get out of there before Popeye finds you!”
My turn: Is Minnie Mouse or Popeye in the room with us? No.
Your turn: Is Minnie Mouse or Popeye in the room with us? *(no)*
My turn. So we cannot talk about them? No
Your turn. So can we talk about them right now? *(no)*

**Rule 1 non-examples:**

a.) It is okay to talk about things that are happening right now. When I say, “I am excited about playing this game” (game must be present in the room), then I am using friendly words.
My turn: Is [game] in the room with us? Yes.
Your turn: Is [game] in the room with us? *(yes)*
My turn: Can we talk about [game]? Yes.
Your turn: Can we talk about [game]? *(yes).*

b.) Here’s another example:
It is okay to talk about things that are happening right now. When I say, “I want to play with you,” then I am using friendly words.
My turn: Is playing with your friends around you friendly? Yes.
Your turn: Is playing with your friends around you friendly? (yes)
My turn: Can we talk about playing with the friends around you? Yes.
Your turn: Can we talk about playing with the friends around you? (yes).

**Rule 1 Discrimination Questions**
Here is a game. We are going to see if I can trick you. You tell me if it is friendly, or not friendly. If it is friendly, say, “yes,” if it is not friendly, say “no.” Listen carefully!

a.) “Big Bird is so happy to sponsor the letter Z today for Sesame Street!”
Again: “Big Bird is so happy to sponsor the letter Z today for Sesame Street!”
When I point to you, if it is friendly, say, “yes,” if it is not friendly, say “no.”
(Students respond)
Good job! Big bird and Sesame Street are not in the room with us, so these are not friendly words.
*Error correction procedure:
Let’s say the rule: If you are talking about a tv show or movie we are not watching right now, your words are not friendly.
Is Big Bird and Sesame Street in the room with us? (no)
So are Big Bird and Sesame Street friendly words right now? (no)
(Repeat example)

b.) Here’s a new one:
“Plankton! I can’t steal Squidward’s secret Crabby Patty recipe! Oh but do it for me Spongebob! And do it for Patrick too!”
Again: “Plankton! I can’t steal Squidward’s secret Crabby Patty recipe! Oh but do it for me Spongebob! And do it for Patrick too!”
When I point to you, if it is friendly, say, “yes,” if it is not friendly, say “no.”
(Students respond)
That’s right! Spongebob, Squidward and Patrick are not in the room with us, so these are not friendly words.
*Error correction procedure:
Are Spongebob or Squidward in the room with us? (no)
So are Spongebob and Squidward friendly words right now? (no)
(Repeat example)

c.) Let’s try another one:
“My shirt is the color [color of your shirt].”
Again: “My shirt is the color [color of your shirt].”
When I point to you, if it is friendly, say, “yes,” if it is not friendly, say “no.”
(Students respond)
Good listening! My shirt is something in the room with us right now, so these are words we can talk about!

*Error correction procedure:*
Is my shirt in the room with us? (yes)
So is my shirt friendly words right now? (yes)
(Repeat example)

d.) New question:
“And today on the nightly NBC news, how the senator of 2004 is affecting us in 2009.”
Again: “And today on the nightly NBC news, how the senator of 2004 is affecting us in 2009.”
When I point to you, if it is friendly, say, “yes,” if it is not friendly, say “no.”
(Students respond)
Nice thinking! The news and the senator are not in the room with us, so these are not friendly words.”

*Error correction procedure:*
Is the news and the years 2004 or 2009 in the room with us? (no)
So are the news and the years 2004 or 2009 friendly words right now? (no)
(Repeat example)

Lets try another one:
“When can we play with [pre-determined reinforcer]?”
Again: “When can we play with [pre-determined reinforcer]?”
When I point to you, if it is friendly, say, “yes,” if it is not friendly, say “no.”
(Students respond)
Excellent work! [reinforcer] is in the room with us right now, so these are words that we can talk about!

*Error correction procedure:*
Lets say the rule: **If you are talking about a tv show or movie we are not watching right now, your words are not friendly.**
Is [pre-determined reinforcer] in the room with us? (yes)
So is [pre-determined reinforcer] friendly words right now? (yes)
(Repeat example)

Note: if students get two or more discrimination questions incorrect, review the rule section and repeat discrimination questions.

*Rule 1 Conclusion:*
Here is the rule: If you are talking about a tv show or movie we are not watching right now, your words are not friendly.
Say the rule with me: **If you are talking about a tv show or movie we are not watching right now, your words are not friendly.**
If it is talking about a tv show or movie I am not watching right now, it is not friendly.
Again, here is the rule: If it is talking about a tv show or movie I am not watching right now, it is not friendly.

*Transition to the session:*
Remember the rule and remember to use friendly, appropriate words. If you use friendly words for $n$ minutes, you will earn a token. If you earn 3 tokens, you will earn [pre-determined reinforcer]. If you do not use friendly words, you may not earn a token or your [pre-determined] reinforcer. Remember to use your friendly appropriate words while we [activity to be completed]!
Script 2: Non-Contextual Words/Language

Introduction
Today we are going to learn about talking to other people. When we talk to other people, it is important to use friendly, appropriate words, so other people can talk to us too. Friendly, appropriate words are words that tell people how we feel, what we want, and things we see right now. Sometimes, we use words that are not friendly and appropriate. When we use these words, other people do not know what we are talking about and they cannot talk to us.

Rule 2: Random Vocalizations/Language
We are going to talk about words that are not friendly. Here is a Rule: If the words are things that are not in the room with us right now, they are not friendly words. Again, here is the rule: If the words are things that are not in the room with us right now, they are not friendly words. Let's say the rule together: If the words are things that are not in the room with us right now, they are not friendly words.

Saying words that are not part of the activity we are doing right now are not friendly words.

When I am talking to my friends or teachers and I say words that are not part of our activity, I am using friendly words. If I am talking about things that are not in the room with or things we are not playing with, I should probably not talk about them. But I can talk to my friends or teachers about things that I see and things that we are doing right now, but if I am talking about things that are not in the room with us.

Rule 2 examples
Say the rule with me: If the words are things that are not in the room with us right now, they are not friendly words.

a.) Here is an example.
If I shout (pause) “Penguins!” to my teacher when we are not playing with penguins. Penguins are not anything that I can see right now and my friends don’t know what I am talking about when I say this, so these are not friendly, appropriate words.

My turn: Are penguins something we can see right now? No
Your turn: Are penguins something we can see right now? (no)
My turn: So can we talk about penguins right now? No
Your turn: So can we talk about penguins right now? (no)
b.) Here is another one.
If I say (pause) “www.waPOW.com!” to my teacher when we are not playing on the computer.
WaPOW.com is not something that we are playing with right now and my friends don’t know what I am talking about when I say this, so these are not friendly, appropriate words.
My turn: Is WaPOW.com something we can see right now? No
Your turn: Is WaPOW.com something we can see right now? (no)
My turn: So can we talk about WaPOW.com right now? No
Your turn: So can we talk about WaPOW.com right now? (no)

Rule 2 discrimination questions
Here is a game. We are going to see if I can trick you. You tell me if it is friendly, or not friendly. If it is friendly, say, “yes,” if it is not friendly, say “no.” Listen carefully!

a.) Here’s the first one:
“Kangaroos in the pickle dish!”
Again: “Kangaroos in the pickle dish!”
When I point to you, if it is friendly, say, “yes,” if it is not friendly, say “no.”
(Students respond)
Nice work! Kangaroos and pickles are not in the room with us, so these words are not friendly.
*Error correction procedure:
Let’s say the rule: If the words are things that are not in the room with us right now, they are not friendly words.
Are kangaroos and pickles in the room with us? (no)
So are kangaroos and pickles friendly words right now? (no)
(Repeat example)

b.) Try this one:
“[Teacher name], Will you help me?”
Again: “[Teacher name], Will you help me?”
(Students respond)
Good thinking! [Teacher’s name] is in the room with us, and you can always ask for help, so these are friendly words.
*Error correction procedure:
Let’s say the rule: If the words are things that are not in the room with us right now, they are not friendly words.
Are teachers in the room with us? (yes)
So are teachers and asking for help friendly words right now? (yes)
(Repeat example)

c.) New question:
“Pickles in the sugar dish!”
Again: “Pickles in the sugar dish!”
(Student respond)
Good thinking! Pickles and sugar dishes are not in the room with us, so these are not friendly words.

*Error correction procedure:
Lets say the rule: If the words are things that are not in the room with us right now, they are not friendly words.
Are pickles or sugar dishes in the room with us right now? (no)
So are words about pickles and sugar dishes friendly words right now? (no)
(Repeat example)

d.) Here is another one:
“I want to play a game with you.”
Again: “I want to play a game with you.”
(Student respond)
Good thinking! [Game] is in the room with us, so these are friendly words.

*Error correction procedure:
Lets say the rule: If the words are things that are not in the room with us right now, they are not friendly words.
Are games in the room with us? (yes)
So are games friendly words right now? (yes)
(Repeat example)

Note: if students get two or more discrimination questions incorrect, review the rule section and repeat discrimination questions

Conclusion
Here is the rule: If the words are things that are not in the room with us right now, they are not friendly words.
Say the rule with me: If the words are things that are not in the room with us right now, they are not friendly words.
Saying words that are not part of the activity we are doing right now are not friendly words.
Again, here is the rule: If the words are things that are not in the room with us right now, they are not friendly words.
Transition to the session:
Remember the rule and remember to use friendly, appropriate words. If you use friendly words for \( n \) minutes, you will earn a token. If you earn 3 tokens, you will earn [pre-determined reinforcer]. If you do not use friendly words, you may not earn a token or your [pre-determined] reinforcer. Remember to use your friendly appropriate words while we [activity to be completed]!
Script 3: Repeating previously heard conversations

Introduction
Today we are going to learn about talking to other people. When we talk to other people, it is important to use friendly, appropriate words, so other people can talk to us too. Friendly, appropriate words are words that tell people how we feel, what we want, and things we see right now. Sometimes, we use words that are not friendly and appropriate. When we use these words, other people do not know what we are talking about and they cannot talk to us.

Rule 3:
We are going to talk about words that are not friendly. Here is a Rule: If you are repeating words that you have heard from other people and they are not in the room with us, they are not friendly words. Again, here is the rule: If you are repeating words that you have heard from other people and they are not in the room with us, they are not friendly words. Let’s say the rule together: If you are repeating words that you have heard from other people and they are not in the room with us, they are not friendly words.

Saying words that are not part of the activity we are doing right now are not friendly words.

When I am talking to my friends or teachers and I say words that are not part of our activity, I am using friendly words. If I am talking about things that are not in the room with or things we are not playing with, I should probably not talk about them. But I can talk to my friends or teachers about things that I see and things that we are doing right now, but if I am talking about things that are not in the room with us.

Rule 3 examples
Say the rule with me: If you are repeating words that you have heard from other people and they are not in the room with us, they are not friendly words.

a.) Here is an example.
If I say “When are we going to eat dinner? We are going to eat dinner at 8 o’clock. Well are we going to eat broccoli?”
Again: “When are we going to eat dinner? We are going to eat dinner at 8 o’clock. Well are we going to eat broccoli?”
Dinner and the people in this conversation are not anything we are doing right now and my friends don’t know what I am talking about when I say this, so these are not friendly, appropriate words.

My turn: Are the people from this conversation or is dinner something we can see right now? No
Your turn: Are the people from this conversation or is dinner something we can see right now? (no)
My turn: So can we talk about this conversation right now? No.
Your turn: So can we talk about this conversation right now? (no)

b.) Try this Example.
When I say, “Oh no! Not that again! What? I didn’t do it! No it’s your fault! You spilled it!”
Again: “Oh no! Not that again! What? I didn’t do it! No it’s your fault! You spilled it!”
Arguing people are not with us, and nobody is spilling anything right now, so these are not friendly, appropriate words.
My turn: Are the people from this conversation or spilling something we see right now? No
Your turn: Are the people from this conversation or spilling something we see right now? (No)
My turn: So can we talk about this conversation right now? No.
Your turn: So can we talk about this conversation right now? (No)

*Rule 3 discrimination training*
Here is a game. We are going to see if I can trick you. You tell me if it is friendly, or not friendly. If it is friendly, say, “yes,” if it is not friendly, say “no.” Listen carefully!

a.) Here’s the first one:
“Are we going to do [activity] today?”
Again: “Are we going to do [activity] today?”
When I point to you, if it is friendly, say, “yes,” if it is not friendly, say “no.”
(Students respond)
Yes! [Activity] is in the room with us and we can talk about things we are going to do, so these are friendly words!

*Error correction procedure:
Lets say the rule: If you are repeating words that you have heard from other people and they are not in the room with us, they are not friendly words.
Is [activity] in the room with us? (Yes)
So is [activity] friendly words right now? (Yes)
(Repeat example)
b.) Try another example:
“Can we go out to recess yet? No, not yet, it’s time for language. So are we going to go to recess after recess? Oh I think yes that might be a good idea!”
Again: “Can we go out to recess yet? No, not yet, it’s time for language. So are we going to go to recess after recess? Oh I think yes that might be a good idea!”
When I point to you, if it is friendly, say, “yes,” if it is not friendly, say “no.”
(Students respond)
Way to go! The people having this conversation are not in the room with us and we are not going to do language or recess, so these words are not friendly.
*Error correction procedure:
Let’s say the rule: If you are repeating words that you have heard from other people and they are not in the room with us, they are not friendly words.
Are the people in this conversation or language work in the room with us? (no)
So the people in this conversation or language work friendly words right now? (no)
(Repeat example)

c.) Try this one:
“Alex would you like some cereal? Why yes, I would love some cereal!”
Again: “Alex would you like some cereal? Why yes, I would love some cereal!”
When I point to you, if it is friendly, say, “yes,” if it is not friendly, say “no.”
(Students respond)
Way to go! The people having this conversation are not in the room with us and we are not having cereal, so these words are not friendly.
*Error correction procedure:
Let’s say the rule: If you are repeating words that you have heard from other people and they are not in the room with us, they are not friendly words.
Are the people in this conversation or cereal in the room with us? (no)
So the people in this conversation or cereal friendly words right now? (no)
(Repeat example)

d.) Here’s the last one:
“[Teacher], I like [item in the room.]”
Again: “[Teacher], I like [item in the room.]”
When I point to you, if it is friendly, say, “yes,” if it is not friendly, say “no.”
(Students respond)
Way to go! The people having this conversation are in the room with us and so is [item], so these words are friendly.
*Error correction procedure:
Let’s say the rule: If you are repeating words that you have heard from other people and they are not in the room with us, they are not friendly words.
Are the people in this conversation or [item] in the room with us? (yes)
So the people in this conversation or [item] friendly words right now? (yes)
(Repeat example)

Note: if students get two or more discrimination questions incorrect, review the rule section and repeat discrimination questions

**Conclusion**
Here is the rule: If you are repeating words that you have heard from other people and they are not in the room with us, they are not friendly words.
Say the rule with me: **If you are repeating words that you have heard from other people and they are not in the room with us, they are not friendly words.**

Saying words that are not part of the activity we are doing right now are not friendly words.
Again, here is the rule: If you are repeating words that you have heard from other people and they are not in the room with us, they are not friendly words.

**Introduction/Transition to the session:**
Remember the rule and remember to use friendly, appropriate words. If you use friendly words for n minutes, you will earn a token. If you earn 3 tokens, you will earn [pre-determined reinforcer]. If you do not use friendly words, you may not earn a token or your [pre-determined] reinforcer. Remember to use your friendly appropriate words while we [activity to be completed]!
**Script 4: Singing**

Today we are going to learn about talking to other people. When we talk to other people, it is important to use friendly, appropriate words, so other people can talk to us too. Friendly, appropriate words are words that tell people how we feel, what we want, and things we see right now. Sometimes, we use words that are not friendly and appropriate. When we use these words, other people do not know what we are talking about and they cannot talk to us.

**Rule 4: Singing**

We are going to talk about words that are not friendly. Here is a Rule: If you are singing a song and we are not doing a music activity, then they are not friendly words. Again, here is the rule: If you are singing a song and we are not doing a music activity, then they are not friendly words.

Let's say the rule together: **If you are singing a song and we are not doing a music activity, then they are not friendly words.**

Saying words that are not part of the activity we are doing right now are not friendly words.

When I am talking to my friends or teachers and I say words that are not part of our activity, I am using friendly words. If I am talking about things that are not in the room with or things we are not playing with, I should probably not talk about them. But I can talk to my friends or teachers about things that I see and things that we are doing right now, but if I am talking about things that are not in the room with us.

**Rule 4 Discrimination Training**

Here is a game. We are going to see if I can trick you. You tell me if it is friendly, or not friendly. If it is friendly, say, “yes,” if it is not friendly, say “no.” Listen carefully!

a.) Here's the first one:

“Strawberry Shortcaaaake” **(in singing voice)**

Again: “Strawberry Shortcaaaake” **(in singing voice)**

When I point to you, if it is friendly, say, “yes,” if it is not friendly, say “no.”

(Students respond)

Great! We are not doing a musical activity so singing and music are not friendly words right now.

*Error correction procedure:*
Let's say the rule: **If you are singing a song and we are not doing a music activity, then they are not friendly words.**

Is music or singing happening in the room right now? *(No)*

So is music or singing friendly words right now? *(No)*

(Repeat example)

b.) Try this example!

“This [activity] is fun, I want to do it again!”

When I point to you, if it is friendly, say, “yes,” if it is not friendly, say “no.”

(Students respond)

Correct! [Activity] is in the room right now, so these words are friendly.

*Error correction procedure:

Let's say the rule: **If you are singing a song and we are not doing a music activity, then they are not friendly words.**

Is [activity] in the room with us? *(Yes)*

So is [activity] friendly words right now? *(Yes)*

(Repeat example)

c.) Here's another one:

“[Teacher] I'm ready for a break.”

Again: “[Teacher] I’m ready for a break.”

When I point to you, if it is friendly, say, “yes,” if it is not friendly, say “no.”

(Students respond)

Great! You can always ask for a break and [teacher] is in the room with us right now, so these are friendly, appropriate words.

*Error correction procedure:

Let's say the rule: **If you are singing a song and we are not doing a music activity, then they are not friendly words.**

Is [teacher] in the room right now and can you ask for breaks? *(yes)*

Are words with [teacher] and breaks friendly words right now? *(yes)*

(Repeat example)

d.) Here's the last one:

“La la la la la la” *(to the tune of the Harry Potter theme song in a singing voice)*

Again: “La la la la la la la” *(to the tune of the Harry Potter theme song in a singing voice)*

When I point to you, if it is friendly, say, “yes,” if it is not friendly, say “no.”

(Students respond)

Great! We are not doing a musical activity so singing and music are not friendly words right now.

*Error correction procedure:
Let's say the rule: **If you are singing a song and we are not doing a music activity, then they are not friendly words.**

Is music or singing happening in the room right now? (No)

So is music or singing friendly words right now? (No)

(Repeat example)

Note: if students get two or more discrimination questions incorrect, review the rule section and repeat discrimination questions.

**Conclusion**

Here is the rule: If you are singing a song and we are not doing a music activity, then they are not friendly words.

Say the rule with me: **If you are singing a song and we are not doing a music activity, then they are not friendly words.**

Saying words that are not part of the activity we are doing right now are not friendly words.

Again, here is the rule: If you are singing a song and we are not doing a music activity, then they are not friendly words.

**Transition to the session:**

Remember the rule and remember to use friendly, appropriate words. If you use friendly words for $n$ minutes, you will earn a token. If you earn 3 tokens, you will earn [pre-determined reinforcer]. If you do not use friendly words, you may not earn a token or your [pre-determined] reinforcer. Remember to use your friendly appropriate words while we [activity to be completed]!
Session 5+: Following Sessions/Prior to each session:
Today we are going to learn about talking to other people.
When we talk to other people, it is important to use friendly, appropriate words, so other people can talk to us too.
Friendly, appropriate words are words that tell people how we feel, what we want, and things we see right now.
Sometimes, we use words that are not friendly and appropriate.
When we use these words, other people do not know what we are talking about and they cannot talk to us.

Rule Review:
Let’s remember the rules for using friendly words:
When we talk to other people, it is important to use friendly, appropriate words, so other people can talk to us too.
Friendly, appropriate words are words that tell people how we feel, what we want, and things we see right now.

a.) Here’s a rule: If you are talking about a tv show or movie we are not watching right now, your words are not friendly.
Say the rule with me: If you are talking about a tv show or movie we are not watching right now, your words are not friendly.

b.) Here’s another rule: If the words are things that are not in the room with us right now, they are not friendly words.
Say the rule with me: If the words are things that are not in the room with us right now, they are not friendly words.

c.) Here’s another rule: If you are repeating words that you have heard from other people and they are not in the room with us, they are not friendly words.
Say the rule with me: If you are repeating words that you have heard from other people and they are not in the room with us, they are not friendly words.

d.) Here’s another rule: If you are singing a song and we are not doing a music activity, then they are not friendly words.
Say the rule with me: If you are singing a song and we are not doing a music activity, then they are not friendly words.

Transition to the session:
Remember the rule and remember to use friendly, appropriate words. If you use friendly words for n minutes, you will earn a token. If you earn 3 tokens, you will
earn [pre-determined reinforcer]. If you do not use friendly words, you may not earn a token or your [pre-determined] reinforcer. Remember to use your friendly appropriate words while we [activity to be completed]!
Appendix D: Data Collection for Script
Data Collection for Script

Instructions: Present each lesson and record data for the discrimination training section of each lesson.

<table>
<thead>
<tr>
<th>Date</th>
<th>Lesson</th>
<th>1</th>
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<th>3</th>
<th>3</th>
<th>% Correct</th>
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Notes:
Appendix E: Preference Assessment
Multiple Stimulus Without Replacement Preference Assessment

Instructions: Present 5 items in front of the student and instruct the student to take one item. Allow the student access to the item they choose for 30 seconds and record the item with a check mark next to its listing. After 30 seconds, place the chosen item back into the array of stimuli, shuffle the stimuli items and allow the student to take one item once again. Once a student chooses an item three times, thus there are three checkmarks next to that listed item, the item should be removed from the array and the removed item should be listed in the hierarchy list. Repeat this process until four of the five items have been eliminated from the array.
Appendix F: Functional Assessment Screening Tool (FAST)
Functional Analysis Screening Tool

Client: __________________________ Date: __________________________
Informant: __________________________ Interviewer: __________________________

To the Interviewer: The FAST identifies environmental and physical factors that may influence problem behaviors. It should be used only for screening purposes as part of a comprehensive functional analysis of the behavior. Administer the FAST to several individuals who interact with the client frequently. Then use the results as a guide for conducting a series of direct observations in different situations to verify behavioral functions and to identify other factors that may influence the problem behavior.

To the Informant: Complete the sections below. Then read each question carefully and answer it by circling “Yes” or “No”. If you are uncertain about an answer, circle “N/A”.

Informant-Client Relationship
1. Indicate your relationship to the client: [ ] Parent [ ] Instructor [ ] Therapist [ ] Paraprofessional [ ] Residential Staff [ ] Other
2. How long have you known the client? ________ years ________ months
3. Do you interact with client daily? [ ] Yes [ ] No
4. In what situations do you usually interact with the client? [ ] Meals [ ] Academic training [ ] Leisure activities [ ] Work or vocational training [ ] Self-care [ ] Other

Problem Behavior Information
1. Problem behavior [check and describe]: [ ] Aggression [ ] Self-injury [ ] Stereotypy [ ] Property destruction [ ] Disruptive behavior
2. Frequency:
   [ ] Hourly [ ] Daily [ ] Weekly [ ] Less
3. Severity:
   mild: disruptive but little risk to property or health
   moderate: property damage or minor injury
   severe: significant threat to health or safety

4. Situations in which the problem behavior is most likely:
   Days/Times:
   Settings/Activities:
5. Situations in which the problem behavior is least likely:
   Days/Times:
   Settings/Activities:
6. What is usually happening to the client right before the problem behavior occurs?
   Days/Times:
   Settings/Activities:
7. What usually happens to the client right after the problem behavior occurs?
8. How do you handle the behavior when it occurs?
9. Comments:

1. Does the client usually engage in the problem behavior when he/she is being ignored or when caregivers are paying attention to someone else?
   [ ] Yes [ ] No [ ] N/A
2. Does the client usually engage in the problem behavior when requests for preferred activities (games, snacks) are denied or when those items are taken away?
   [ ] Yes [ ] No [ ] N/A
3. When the problem behavior occurs, do you or other caregivers usually try to calm the client down or try to engage the client in preferred activities?
   [ ] Yes [ ] No [ ] N/A
4. Is the client usually well behaved when he/she is getting lots of attention or when preferred items or activities are freely available?
   [ ] Yes [ ] No [ ] N/A
5. Is the client resistant when asked to perform a task or to participate in group activities?
   [ ] Yes [ ] No [ ] N/A
6. Does the client usually engage in the problem behavior when asked to perform a task or to participate in group activities?
   [ ] Yes [ ] No [ ] N/A
7. When the problem behavior occurs, is the client usually given a break from tasks?
   [ ] Yes [ ] No [ ] N/A
8. Is the client usually well behaved when he/she is not required to do anything?
   [ ] Yes [ ] No [ ] N/A
9. Does the problem behavior seem to be a “ritual” or habit, repeatedly occurring the same way?
   [ ] Yes [ ] No [ ] N/A
10. Does the client usually engage in the problem behavior even when no one is around or watching?
    [ ] Yes [ ] No [ ] N/A
11. Does the client prefer engaging in the problem behavior over other types of leisure activities?
    [ ] Yes [ ] No [ ] N/A
12. Does the problem behavior appear to provide some sort of sensory stimulation?
    [ ] Yes [ ] No [ ] N/A
13. Does the client usually engage in the problem behavior more often when he/she is ill?
    [ ] Yes [ ] No [ ] N/A
14. Is the problem behavior cyclical, occurring at high rates for several days and then stopping?
    [ ] Yes [ ] No [ ] N/A
15. Does the client have recurrent painful conditions such as ear infections or allergies? If so, please list:
    [ ] Yes [ ] No [ ] N/A
16. If the client is experiencing physical problems, and these are treated, does the problem behavior usually go away?
    [ ] Yes [ ] No [ ] N/A

Scoring Summary - Circle the number from above of each question answered “Yes”.

<table>
<thead>
<tr>
<th>Items circled “Yes”</th>
<th>Total</th>
<th>Potential Source of Reinforcement</th>
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<tbody>
<tr>
<td>1</td>
<td>2 3 4</td>
<td>Attention/Preferred Items [Social]</td>
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<td>5</td>
<td>6 7 8</td>
<td>Escape [Social]</td>
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<td>9</td>
<td>10 11 12</td>
<td>Sensory Stimulation [Social]</td>
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<td>13</td>
<td>14 15 16</td>
<td>Pain Attenuation [Automatic]</td>
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</tbody>
</table>

Appendix G: Data Collection for Sessions
Data Collection Sheets for Appropriate and Inappropriate Vocalizations

Instructions for recording vocal stereotypy:
Every 20 seconds, record a + if vocal stereotypy occurred at any point in that 20 second interval or a – if vocal stereotypy did not occur during that 20 second time interval. At the end of the session, record the percentage of intervals in which vocal stereotypy occurred. For this study, vocal stereotypy is defined as audible vocalizations that can be heard from a minimum of 1.5 feet away from the speaker, which are out of the context of the situation or non-functional speech (e.g. singing, repeating movies, growling, unintelligible speech, etc.). The target behavior includes instances of audible language out of the context of the situation but does not include functional speech, gestures, laughter or requests for items or information.

Instructions for recording contextually appropriate vocalizations:
Every 20 seconds, record a + if contextually appropriate vocalizations occurred and a – if contextually appropriate vocalizations did not occur for that 20 second time interval. At the end of the session, record the percentage of intervals in which contextually appropriate vocalizations were emitted. For this study, contextually appropriate vocalizations are defined as audible vocalizations that can be heard from a minimum of 1.5 feet away from the speaker that are in the context of the situation or activity and are functional speech as defined by Skinner’s verbal operants (e.g. requesting items, activities, or information, commenting on elements of the current environment, etc.).

Notes:

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<tr>
<th>Date</th>
<th>Setting</th>
<th>% Vocal stereotypy</th>
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Date: Setting: % Vocal stereotypy:

Notes:

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<th>Date</th>
<th>Setting</th>
<th>% Vocal stereotypy</th>
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Notes:

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<tr>
<th>Time between DRO Onset and Offset</th>
<th>Instances of RIRD</th>
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<tr>
<td>Start DRO:</td>
<td>Tally:</td>
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<tr>
<td>Stop DRO:</td>
<td>Total:</td>
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<tr>
<td>Total Time</td>
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</table>
Appendix H: Token Board
I would like to earn
ing F\O\N\D\L\Y and APPROPRIATE words!
Appendix I: Social Validity Questionnaire
Questionnaire for Social Validity on the Effects of Response Interruption and Redirection and Differential Reinforcement of Other Behaviors through a Token Economy System on Rates of Vocal Stereotypy

1.) Prior to the intervention, please rate the individual’s rates of vocal stereotypy in comparison to their classroom peers.

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<tbody>
<tr>
<td>almost never</td>
<td>less than peers</td>
<td>About the same</td>
<td>more than peers</td>
<td>almost constantly</td>
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</tbody>
</table>

2.) Prior to the intervention, please rate the individual’s rates of vocal stereotypy in comparison to their “typical” peers.

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<tr>
<td>almost never</td>
<td>less than peers</td>
<td>About the same</td>
<td>more than peers</td>
<td>almost constantly</td>
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</table>

3.) After the intervention, please rate the individual’s rates of vocal stereotypy in comparison to their classroom peers.

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<tbody>
<tr>
<td>almost never</td>
<td>less than peers</td>
<td>About the same</td>
<td>more than peers</td>
<td>almost constantly</td>
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</table>

4.) After the intervention, please rate the individual’s rates of vocal stereotypy in comparison to their “typical” peers.

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<td>less than peers</td>
<td>About the same</td>
<td>more than peers</td>
<td>almost constantly</td>
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5.) Given the individual’s peer interactions prior to the intervention, how necessary did you find the implementation of the intervention to be?

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<td>mostly</td>
<td>very necessary</td>
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<td>not imperative</td>
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6.) Given the individual’s instructional attention prior to the intervention, how necessary did you find the implementation of the intervention to be?

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<td>very necessary</td>
<td>somewhat, but neutral</td>
<td>mostly</td>
<td>very necessary</td>
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<tr>
<td>not imperative</td>
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7.) Please describe how willing you would be to implement this intervention in the future:

   1  2  3  4  5
   never  with changes  maybe  probably  anytime

8.) How well would the intervention implementation fit into your daily routine?

   1  2  3  4  5
   not at all, many disruptions  neutral  few disruptions  easily fit
   very disruptive  to the routine  to the routine  into routine

9.) Please rate how easily you understood the intervention:

   1  2  3  4  5
   not at all  somewhat, neutral  mostly  very clearly with questions

10.) Do you find the procedures of the intervention to be cost-effective?

    1  2  3  4  5
    not at all  somewhat  neutral  mostly  very cost effective

11.) How would you say the person receiving the intervention preferred it to other reinforcement-based interventions or procedures?

    1  2  3  4  5
    not at all  somewhat  neutral  mostly  very preferred

12.) How would you say the individual's social interactions with peers have improved from this intervention?

    1  2  3  4  5
    not at all  somewhat  neutral  mostly  much better but not a lot

13.) How would you say the individual's instructional interactions and/or attention has improved from this intervention?

    1  2  3  4  5
    not at all  somewhat  neutral  mostly  much better but not a lot
Suggestions for improvement or other comments:

Appendix J: Treatment Integrity Checklist
# Treatment Integrity Checklist

Instructions: for each criterion, take +/- data for each opportunity to complete the skill component.

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<th>% Integrity</th>
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<td>Scripted lessons with correct 1st response data</td>
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<td>Preference assessment completed</td>
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<td>RIRD implemented upon instances of vocal stereotypy</td>
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<tr>
<td>Accurate in RIRD implementation (3 correct, consecutive responses, redirected)</td>
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<table>
<thead>
<tr>
<th>Session Date:</th>
<th>% Integrity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scripted lessons with correct 1st response data</td>
<td></td>
</tr>
<tr>
<td>Preference assessment completed</td>
<td></td>
</tr>
<tr>
<td>RIRD implemented upon instances of vocal stereotypy</td>
<td></td>
</tr>
<tr>
<td>Accurate in RIRD implementation (3 correct, consecutive responses, redirected)</td>
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Appendix K: Inter-Observable Agreement Summarization Chart
**IOA Summarization Chart**

IOA Method: Mean Count Per Interval
The formula for this method is \( \frac{\text{[Interval 1 IOA + Interval 2 IOA + Interval N IOA]}}{\text{number of intervals}} \times 100 \) where each interval of IOA is conducted by: Smaller count of behavior occurrences / Larger count of behavior occurrences \( \times 100 \) and \( N \) = each successive interval.

<table>
<thead>
<tr>
<th>Session/Date</th>
<th>Porsha’s Data</th>
<th>Cara’s Data</th>
<th>IOA</th>
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<tbody>
<tr>
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Notes
Appendix L: Functional Behavior Assessment Ranking
## FBA Direct Observation Rankings for _____

<table>
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<th>Date:</th>
<th>Observer:</th>
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<tbody>
<tr>
<td>Stereotypy Type:</td>
<td>Number of Tallys:</td>
</tr>
<tr>
<td>Copy Movies/TV</td>
<td></td>
</tr>
<tr>
<td>Copy Others</td>
<td></td>
</tr>
<tr>
<td>Singing</td>
<td></td>
</tr>
<tr>
<td>Non-Contextual</td>
<td></td>
</tr>
<tr>
<td>Perceived Function</td>
<td>Number of Tallys:</td>
</tr>
<tr>
<td>Obtain Attention</td>
<td></td>
</tr>
<tr>
<td>Obtain Item/Activity</td>
<td></td>
</tr>
<tr>
<td>Obtain Self-Stimulation</td>
<td></td>
</tr>
<tr>
<td>Avoid Demand</td>
<td></td>
</tr>
<tr>
<td>Avoid Activity</td>
<td></td>
</tr>
<tr>
<td>Avoid Person</td>
<td></td>
</tr>
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</table>
Appendix M: Staff Implementation Data
**RIRD Generalization and Staff Implementation for**

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**Vocal Stereotypy (Inappropriate Vocalizations)**

For this study, vocal stereotypy is defined as audible vocalizations that can be heard from a minimum of 1.5 feet away from the speaker, which are out of the context of the situation or non-functional speech (e.g. singing, repeating movies, growling, unintelligible speech, etc.). The target behavior includes instances of audible language out of the context of the situation but does not include functional speech, gestures, laughter or requests for items or information.

**Contextually Appropriate Vocalizations**

For this study, contextually appropriate vocalizations are defined as audible vocalizations that can be heard from a minimum of 1.5 feet away from the speaker that are in the context of the situation or activity and are functional speech as defined by Skinner's verbal operants (e.g. requesting items, activities, or information, commenting on elements of the current environment, etc.).

**Response Interruption and Redirection**

Upon each instance of vocal stereotypy, interrupt the consumer with questions/demands requiring vocal responses using questions in which the individual already has mastered the answers. The consumer should answer 3 questions correctly and consecutively before the previous activity is resumed. Once they answer questions correctly, redirect the consumer back to an appropriate vocalization for that activity.

<table>
<thead>
<tr>
<th>Date:</th>
<th>Initials:</th>
<th>Start Time:</th>
<th>End Time:</th>
<th>Total Time:</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIRD:</td>
<td>Contextually Appropriate Vocalizations:</td>
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</tbody>
</table>

<table>
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